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DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

QUALITY OF SURFACE WATER AT SELECTED SITES IN THE SUWANNEE RIVER BASIN, FLORIDA, 1980

By John E. Coffin

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UNITED STATES DEPARTMENT OF THE INTERIOR

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CONVERSION FACTORS

For use of those readers who may prefer to use metric (SI) units rather than inch-pound units, the conversion factors for the terms used in this report are listed below:

Multiply	By	To obtain
cubic feet (ft^3)	0.02832	cubic meters (m^3)
gallons (gal)	3.785	liters (L)
miles (mi)	1.609	kilometers (km)
square miles (mi^2)	2.590	square kilometers (km^2)
cubic feet per second (ft^3/s or cfs)	0.02832	cubic meters per second (m^3/s)
gallons per minute (gal/min)	0.06309	liters per second (L/s)

To assist those readers not familiar with scientific notations used in some of the graphs, the conversion factors are listed below:

A scientific notation of	Is equal to	A scientific notation of	Is equal to
10^5	100,000	10^1	10
10^4	10,000	10^0	1.0
10^3	1,000	10^{-1}	0.10
10^2	100	10^{-2}	0.01
		10^{-3}	0.001

GLOSSARY

Biochemical Oxygen Demand (BOD)--a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by micro-organisms, such as bacteria.

Class III Waters--categorization, in State of Florida Rules, of water used for recreation, propagation, and management of fish and wildlife.

Cubic feet per second (ft^3/s or cfs)--the rate of discharge representing a volume of 1 cubic foot passing a given point in 1 second. A discharge rate of 1 ft^3/s is equivalent to 7.48 gallons per second or 448.8 gallons per minute.

Discharge--the volume of water (or more broadly, total fluids) that passes a given point within a given period of time.

Micrograms per liter (ug/L)--a unit expressing the concentration of chemical constituents in solution as weight (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (mg/L)--a unit expressing the concentration of chemical constituents in solution. Milligrams per liter represents the weight of solute (in milligrams) per unit volume (one liter) of water.

Specific Conductance--a measure of the ability of a water to conduct an electrical current, expressed in micromhos per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids concentration of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream, and it may vary at the same point with a change in the composition of the water.

Total Organic Carbon (TOC)--a measure of the organically related carbonaceous content of water. It includes all natural and manmade organic compounds which are combustible at a temperature of 950°C.

QUALITY OF SURFACE WATER AT SELECTED SITES IN THE SUWANNEE RIVER BASIN, FLORIDA, 1980

By John E. Coffin

ABSTRACT

This report presents the results of analyses of water-quality samples collected from 14 surface-water sites in the Suwannee River basin in Florida from January through December 1980. The U.S. Geological Survey, in a cooperative investigative program with the Suwannee River Authority, has sampled a network of nine water-quality monitoring stations since 1968 to detect short-term and long-term changes in surface-water quality in the Suwannee River. Two additional stations, Camp Branch near Genoa and Rocky Creek near Houston, were established in October 1978. Three more stations have been included in this report. They are Deep Creek and Robinson Creek near Suwannee Valley, which originate in the Osceola National Forest, and Santa Fe River at Worthington Springs. The forest stations have been supported since April 1976 through a cooperative agreement with the U.S. Bureau of Land Management and the Worthington Springs station was established as a National Stream Quality Accounting Network (NASQAN) station in March 1979.

The analyses of samples collected routinely included: nutrients, total organic carbon, and 5-day biochemical oxygen demand, bimonthly; and trace metals, annually. The array of constituents sampled was expanded in October 1974 at three of the original nine stations to provide quality-of-water information for streams draining an industrial area: Rocky Creek near Belmont, Hunter Creek near Belmont, and Swift Creek at Facil. Data collected at these three sites now include: major chemical constituents, six times per year; radium-226, two times per year; and trace metals, one time per year. These constituents are determined in addition to nutrients, total organic carbon, and biochemical oxygen demand which continue to be analyzed six times per year.

All results of analyses of the water-quality samples collected from January through December 1980 remained within, or near, previously measured ranges and water-quality fluctuations were similar to those noted from data collected since 1971.

INTRODUCTION

The Suwannee River drains approximately 9,950 square miles of Georgia and Florida as it meanders southward from the Okefenokee Swamp and 202 river miles of Georgia and Florida to the Gulf of Mexico--a straight line distance in Florida of about 100 miles. The Withlacoochee, Alapaha, and Santa Fe Rivers are major tributaries to the Suwannee River (fig. 1). Numerous springs contribute to the flow of the Suwannee and its tributary streams. Nine springs are of first magnitude (average flows of at least 100 ft^3/s) with a total average discharge of 2,100 ft^3/s (Rosenau and others, 1977, p. 7). Streamflow records show that the 40-year average discharge of the Suwannee River at Wilcox is 10,580 ft^3/s. The maximum discharge of 84,700 ft^3/s occurred on April 14, 1948, and the minimum of 3,270 ft^3/s occurred on February 24, 1957. The Wilcox station, being the most downstream gaging site, indicates the total river discharge to the gulf. In water year 1980, the station recorded an average discharge of 10,760 ft^3/s, a maximum of 26,600 ft^3, and a minimum of 4,800 ft^3/s. These figures do not take into account the additional increase in discharge which occurs between Wilcox and the gulf.

The economy of the area is primarily agricultural, including dairy and truck farming. A large portion of the work force, however, is involved in other industries including construction, mining, manufacturing, and agribusiness.

The U.S. Geological Survey has been monitoring the water quality of streams in the Suwannee River basin since 1968 under a cooperative agreement between the Survey and the Suwannee River Authority. The jointly funded investigation is seeking to detect short-term and long-term changes in the quality of river water through extensive chemical and physical sampling and analysis. Hydrologic data are also collected at two gaging stations on creeks which originate in Osceola National Forest; these stations are supported with funds from the U.S. Bureau of Land Management and the Survey. Both creeks are generally representative of natural streamflow and water quality from a forested area of the Suwannee River basin. Another station, located on the Santa Fe River at Worthington Springs, was recently established as a NASQAN site (National Stream Quality Accounting Network). It is one of 29 stations in Florida that are Federally funded and designed to meet water-quality information needs of agencies involved in planning on a national or regional scale. These three stations are included in this report in order to provide the Authority with a wider possible water-quality base.

Eighteen stream gaging stations are used to monitor the flow of the Suwannee River and its tributaries in Florida. This report presents chemical and physical data collected from January through December 1980

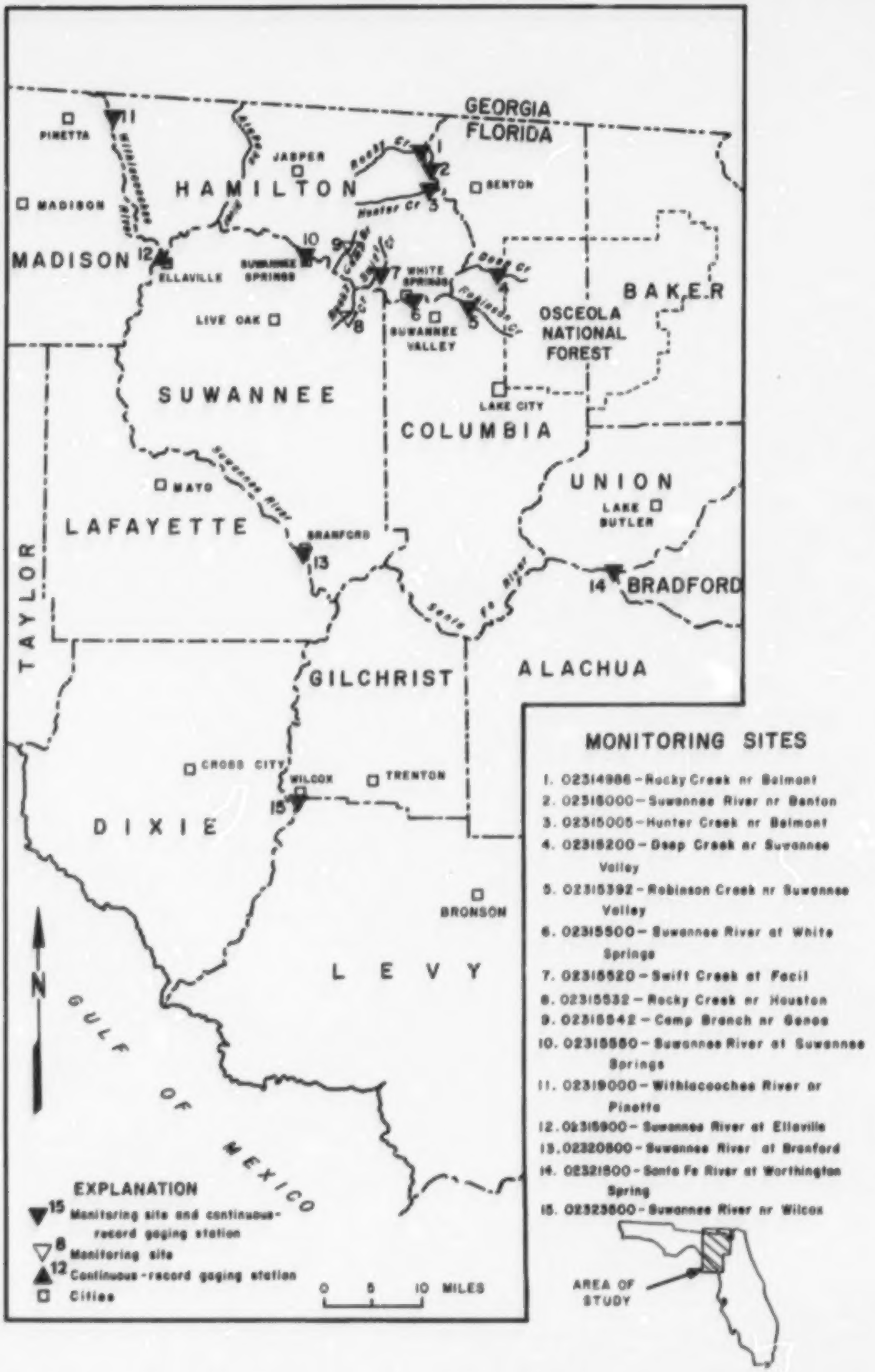
GEORGIA
FLORIDA
PINETTA
Withlacoochee River
Alapaha River
JASPER
Rocky Cr
Hunter Cr
BENTON
MADISON
HAMILTON
MADISON
ELLAVILLE
SUWANNEE SPRINGS
WHITE SPRINGS
Deep Cr
Robinson Cr
SUWANNEE VALLEY
LIVE OAK
BAKER
OSCEOLA NATIONAL FOREST
LAKE CITY
SUWANNEE
COLUMBIA
UNION
LAKE BUTLER
MAYO
Suwannee River
LAFAYETTE
BRANFORD
TAYLOR
BRADFORD
Santa Fe River
GILCHRIST
ALACHUA
CROSS CITY
WILCOX
TRENTON
DIXIE
BRONSON
LEVY
N
GULF OF MEXICO
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
EXPLANATION
15 Monitoring site and continuous-record gaging station
8 Monitoring site
12 Continuous-record gaging station
Cities
0 5 10 MILES
MONITORING SITES
1. 02314986 - Rocky Creek nr Belmont
2. 02315000 - Suwannee River nr Benton
3. 02315005 - Hunter Creek nr Belmont
4. 02315200 - Deep Creek nr Suwannee Valley
5. 02315392 - Robinson Creek nr Suwannee Valley
6. 02315500 - Suwannee River at White Springs
7. 02315520 - Swift Creek at Facil
8. 02315532 - Rocky Creek nr Houston
9. 02315542 - Camp Branch nr Genoa
10. 02315550 - Suwannee River at Suwannee Springs
11. 02319000 - Withlacoochee River nr Pinetta
12. 02315900 - Suwannee River at Ellaville
13. 02320500 - Suwannee River at Branford
14. 02321500 - Santa Fe River at Worthington Spring
15. 02323500 - Suwannee River nr Wilcox
AREA OF STUDY

Figure 1.--Location of sampling stations in the Suwannee River basin, Florida.

at 14 of those stations. Selected data from previous years are included to show long-term trends of chemical and physical water-quality variables (Hull and others, 1980; Coffin, 1981). Water-quality samples are collected at five of six stations on the Suwannee and at nine of 12 stations on its tributaries.

STATION DESCRIPTIONS

The northernmost gaging station on a stream tributary to the Suwannee River in Florida is Rocky Creek near Belmont. The drainage area at this station is 50.0 square miles. Since August 1970, water-quality samples collected at this station have generally been analyzed for: nutrients, biochemical oxygen demand (BOD), and total organic carbon (TOC), bimonthly; and trace metals, annually. In October 1978, the sampling program was expanded to include major constituents (calcium, magnesium, bicarbonate, sulfate, sodium, chloride, potassium, and fluoride) six times per year and radium-226 two times per year. Discharge extremes are a maximum measured flow of 2,410 ft^3/s on April 6, 1973, and a minimum of no flow recorded many days during 1976-77. Located 1.4 miles upstream from the mouth of the creek, this site may be affected by backwater from the Suwannee River.

The northernmost gaging station on the main stem of the Suwannee River in Florida is Suwannee River near Benton. Located 6.4 river miles south of the Florida-Georgia State line and 196 miles upstream from the mouth of the river, it has a drainage area of 2,090 square miles in Georgia and Florida, which includes part of the watershed of the Okefenokee Swamp. Since October 1975, water-quality samples collected at this station have generally been analyzed for: nutrients, BOD, and TOC, bimonthly; and trace metals, annually. Prior to October 1975, this was an alternate site for making discharge measurements when the stage at White Springs was extremely high. Discharge extremes are a maximum measured flow of 27,000 ft^3/s on April 6, 1973, and a minimum recorded flow of 5.0 ft^3/s on August 9, 1977.

The station on Hunter Creek near Belmont is 0.8 miles upstream from the mouth of the creek and has a drainage area of 25.4 square miles. Since August 1971, water-quality samples collected at this station have generally been analyzed for: nutrients, BOD, and TOC, bimonthly; and trace metals, annually. In October 1978, the sampling program was expanded to include major constituents six times per year and radium-226 two times per year. This station was converted to a daily discharge site in January 1979. Discharge extremes are a maximum measured flow of 425 ft^3/s on June 26, 1972, and a minimum measured flow of 1.03 ft^3/s on June 6, 1977.

The station on Deep Creek near Suwannee Valley is 4.0 miles upstream from the mouth of the creek and has a drainage area of

88.6 square miles. Established in April 1976 as part of a study to determine the impact of potential phosphate mining in the Osceola National Forest, it is generally representative of natural streamflow and water quality from a forested area of the Suwannee River basin. Water-quality samples collected at this station have varied in frequency of collection. Sample analyses have generally included filtered and unfiltered nutrients, TOC, major constituents, trace metals, and radium-226. Discharge extremes are a maximum recorded flow of 961 ft^3/s on March 11, 1980, and a minimum recorded flow of 0.19 ft^3/s on May 25, 1977.

The station on Robinson Creek near Suwannee Valley is 3.4 miles upstream from the mouth of the creek and has a drainage area of 27.4 square miles. Also established in April 1976 as part of a study to determine the impact of potential phosphate mining in the Osceola National Forest, it is generally representative of natural streamflow and water quality from a forested area in the Suwannee River basin. Water-quality samples collected here have been for the same type of analysis and frequency of collection as those of Deep Creek. Discharge extremes are a maximum recorded discharge of 762 ft^3/s on March 10, 1980, and a minimum of no flow recorded many days in 1977.

Suwannee River at White Springs is 171 river miles upstream from the mouth of the river and has a drainage area of 2,430 square miles. Water-quality samples have generally been collected bimonthly for nutrient analysis and annually for trace metals. Discharge extremes are a maximum recorded flow of 38,100 ft^3/s on April 10, 1973, and a minimum recorded flow of 4.8 ft^3/s on November 15, 1931.

The station on Swift Creek at Facil is 2.8 miles upstream from the mouth of the creek and has a drainage area of 65.3 square miles. Since about 1965, flow has been partly regulated by control structures on the main channel, Altmans Bay canal, and an unnamed tributary. There is a possible interchange of water between Swift Creek, Hunter Creek, and Roaring Creek basins due to releases from the diked phosphate area encompassing parts of the three basins. Flow may contain some ground water pumped from the Floridan aquifer and used for phosphate industry processing. Since August 1969, water-quality sampling has generally included analyses for: nutrients, BOD, and TOC, bimonthly; and trace metals, annually. In October 1978, the sampling program was expanded to include analyses of major constituents six times per year and radium-226 two times per year. Discharge extremes are a maximum measured flow of 1,180 ft^3/s on June 27, 1972, and a minimum recorded flow of 1.6 ft^3/s on November 12, 1977.

The station on Rocky Creek near Houston is 2.5 miles upstream from the mouth of the creek and has a drainage area of 25.3 square miles. It generally been analyzed for: nutrients, BOD, TOC, and major constituents six times per year; radium-226 twice per year; and trace metals once per year. Discharge extremes are a maximum measured flow of 56 ft^3/s on April 5, 1979, and a minimum of no flow observed on October 2 and December 4, 1978.

The station on Camp Branch near Genoa is 3.5 miles upstream from the mouth of the creek and has a drainage area of 6.1 square miles. It was established in October 1978 to expand data-collection activities in the area of Occidental Chemical Company. Water-quality samples have generally been analyzed for: nutrients, BOD, TOC, and major constituents six times per year; radium-226 twice per year; and trace metals once per year. Discharge extremes are a maximum measured flow of 10 ft^3/s on October 1, 1979, and minimum of no flow observed on October 2 and December 4, 1978.

Suwannee River at Suwannee Springs is 150 river miles upstream from the mouth of the river and has a drainage area of 2,630 square miles. Water-quality analyses generally include: nutrients, BOD, and TOC, bimonthly; and trace metals, annually. Discharge extremes are a maximum flow of 30,100 ft^3/s, determined indirectly from floodmarks, on April 12, 1973. A minimum discharge of 101 ft^3/s was recorded August 7-9, 1977.

The station on Withlacoochee River near Pinetta is 22 miles upstream from the mouth of the river and has a drainage area of approximately 2,120 square miles. Water-quality samples collected at this site generally are analyzed for: nutrients, BOD, and TOC, bimonthly; and trace metals, annually. Discharge extremes are a maximum flow of 79,400 ft^3/s, determined indirectly from floodmarks, on April 5, 1948. A minimum flow of 70 ft^3/s was recorded August 23, 1955.

The fourth downstream main-stem gaging station on the Suwannee River in Florida is near Ellaville. It is 200 feet downstream from the mouth of the Withlacoochee River and 127 river miles upstream from the mouth of the Suwannee River. It has a drainage area of 6,970 square miles. The maximum discharge, determined indirectly from floodmarks, was 95,300 ft^3/s on April 7-8, 1948. The minimum discharge of 882 ft^3/s was measured on July 17, 1955. Water-quality samples are not collected at this site because of incomplete mixing of Withlacoochee River water with that of the Suwannee River.

Suwannee River at Branford is 75 river miles upstream from the mouth of the river and has a drainage area of 7,880 square miles. Discharge extremes are a recorded maximum flow of 83,900 ft^3/s on April 11, 1948, and a minimum recorded flow of 1,530 ft^3/s on July 1-2, 1955. This station has been designated as a NASQAN station.

The station on Santa Fe River at Worthington Springs is 51 miles upstream from the mouth of the river and has a drainage area of 575 square miles. Discharge extremes are a maximum recorded flow of 20,000 ft^3/s on September 13, 1964, and a minimum recorded flow of 0.50 ft^3/s on June 24, 1955. This has also been designated as a NASQAN station. Data presented in the graphs and tables for this station start in March 1979 when NASQAN sampling was first begun.

The southernmost main-stem gaging station is Suwannee River near Wilcox. Located 33 miles upstream from the mouth of the river, it has a drainage area of 9,640 square miles. Water-quality samples collected generally are analyzed for: nutrients, BOD, TOC, bimonthly; and trace metals, annually. Discharge extremes are a maximum recorded flow of 84,700 ft^3/s on April 14, 1948, and a minimum recorded flow of 3,270 ft^3/s on February 24, 1957. Discharge is affected by Gulf of Mexico tides. This effect is minimal for discharges above 17,500 ft^3/s. Below this discharge tidal effect becomes more pronounced and discharge figures are adjusted according to magnitude of the tide effect.

SUMMARY OF DATA

Locations of the stations at which samples were collected are shown in figure 1. Chemical and physical water-quality data for the 1980 samplings are listed in tables 1 through 14. Table 15 lists maximum, minimum, and mean values for data available since October 1968. Table 16 is an inventory of the number of water-quality samples collected for each station for 21 categories. The number shown under each category represents the number of samples collected in a given year. Table 17 lists the recommended constituent limits for Class III waters for selected parameters. Table 18 briefly discusses the general significance of selected constituents and their possible sources. Selected parameter time graphs for each of the sampling stations are shown in figures 2 through 57. The time graphs show the general trend of the water-quality parameters since January 1971, or since the station was activated.

All results of the analyses of the water-quality samples collected during 1980 remained within, or near, previously measured ranges and water-quality fluctuations were similar to those noted from data collected since 1971.

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Table 1.--Chemical and physical parameters, January to December 1980, for Rocky Creek near Belmont

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
FEB , 1980 04...	1530	3.29	26	80	3.4	6.0	1.0	10.8	86	.4	10	10
MAR 24...	1714	5.89	146	80	3.3	19.0	1.0	7.1	75	1.4	7	7
JUN 04...	1500	2.20	6.3	100	3.7	25.0	1.0	4.9	58	.9	10	10
AUG 06...	1230	1.86	3.4	108	4.2	27.5	3.0	4.8	60	1.5	17	17
SEP 30...	1000	1.93	2.3	80	3.8	23.0	1.0	4.4	50	.3	15	14
DEC 02...	1330	3.52	31	94	3.5	12.0	--	8.0	73	.9	10	10

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
FEB , 1980 04...	1.9	1.2	4.0	47	.6	.1	0	.0	11	9.3	.1	5.8
MAR 24...	1.2	1.0	2.7	45	.4	.1	0	.0	12	8.1	.1	3.7
JUN 04...	2.1	1.2	4.1	46	.6	.2	0	.0	13	10	.1	3.4
AUG 06...	3.3	2.1	4.3	35	.5	.3	0	.0	17	11	.2	8.2
SEP 30...	3.0	1.7	3.6	35	.4	.2	1	.0	11	9.5	.4	5.3
DEC 02...	2.0	1.3	5.3	52	.7	.1	0	.0	12	10	.1	6.5

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, DISSOLVED (TONS PER DAY)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)
FEB , 1980 04...	140	34	.19	9.83	.00	.020	.02	.070	1.1	1.1	1.1	5.3
MAR 24...	146	30	.20	57.6	.00	.030	.03	.010	1.4	1.4	1.4	6.4
JUN 04...	167	34	.23	2.85	.00	.040	.04	.060	.50	.56	.60	2.7
AUG 06...	202	47	.27	1.85	.00	.050	.05	.050	2.2	2.2	2.3	10
SEP 30...	157	36	.21	1.01	.00	.020	.02	.020	1.4	1.4	1.4	6.4
DEC 02...	147	37	.20	12.4	.00	.020	.02	.020	1.6	1.6	1.6	7.3

DATE	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, SUSPENDED RECOV. (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)	ANTIMONY, SUSPENDED TOTAL (UG/L AS SB)	ANTIMONY, DISSOLVED (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB , 1980 04...	.040	.040	--	--	--	0	--	--	--	--	--	--
MAR 24...	.060	.060	--	--	--	--	--	--	--	--	--	--
JUN 04...	.120	.120	--	--	--	0	0	0	--	--	--	--
AUG 06...	.170	.170	--	--	--	3	--	--	--	--	--	--
SEP 30...	.090	.090	500	80	420	0	--	--	1	0	3	670
DEC 02...	.110	.110	--	--	--	0	--	--	--	--	--	--

Table 1.--Chemical and physical parameters, January to December 1980, for Rocky Creek near Belmont--Continued

DATE	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB , 1980								
04...	--	--	--	--	--	--	--	--
MAR								
24...	--	--	--	--	--	--	--	--
JUN								
04...	--	--	--	--	--	--	--	--
AUG								
06...	--	--	--	--	--	--	--	--
SEP								
30...	40	630	3	0	6	40	0	40
DEC								
02...	--	--	--	--	--	--	--	--

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	STRON-TIUM, TOTAL RECOV-ERABLE (UG/L AS SR)	STRON-TIUM, SUS-PENDED RECOV. (UG/L AS SR)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980								
04...	--	--	--	--	9	--	--	65
MAR								
24...	--	--	--	--	40	.08	--	72
JUN								
04...	--	--	60	50	10	--	--	82
AUG								
06...	--	--	--	--	--	--	--	92
SEP								
30...	.1	0	--	--	10	.11	10	75
DEC								
02...	--	--	--	--	10	--	--	61

Table 2.--Chemical and physical parameters, January to December 1980, for Suwannee River near Benton

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB , 1980											
04...	1245	81.07	1625	60	3.4	7.0	1.0	11.4	93	.5	.1
MAR											
24...	1900	86.86	3690	52	3.8	19.0	1.0	5.1	54	1.4	.2
JUN											
05...	1330	79.21	1110	57	3.5	27.0	1.0	6.1	75	1.6	.2
AUG											
05...	1350	75.91	265	65	4.1	31.0	3.0	6.7	89	.6	.1
SEP											
29...	1345	74.80	71	52	6.1	28.0	1.0	6.4	81	.3	.1
DEC											
02...	1200	77.98	769	53	3.5	12.0	--	9.3	85	1.1	.3

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
FEB , 1980									
04...	.00	.010	.01	.030	.72	.75	.76	3.4	.020
MAR									
24...	.00	.020	.02	.010	.79	.80	.82	3.6	.040
JUN									
05...	.00	.020	.02	.010	1.6	1.6	1.6	7.2	.070
AUG									
05...	.00	.010	.01	.020	1.0	1.0	1.0	4.6	.080
SEP									
29...	.00	.010	.01	.030	.79	.82	.83	3.7	.110
DEC									
02...	.00	.010	.01	.020	.78	.80	.81	3.6	.070

DATE	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, SUS-PENDED RECOV. (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
FEB , 1980								
04...	.020	--	--	--	--	--	--	--
MAR								
24...	.040	--	--	--	--	--	--	--
JUN								
05...	.050	--	--	--	--	--	--	--
AUG								
05...	.080	--	--	--	--	--	--	--
SEP								
29...	.110	240	70	170	1	0	2	530
DEC								
02...	.070	--	--	--	--	--	--	--

DATE	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980												
04...	--	--	--	--	--	--	--	--	--	--	--	36
MAR												
24...	--	--	--	--	--	--	--	--	--	--	--	43
JUN												
05...	--	--	--	--	--	--	--	--	--	--	--	41
AUG												
05...	--	--	--	--	--	--	--	--	--	--	--	36
SEP												
29...	40	490	2	0	4	20	0	20	<.1	1	1	36
DEC												
02...	--	--	--	--	--	--	--	--	--	--	--	35

Table 3.--Chemical and physical parameters, January to December 1980, for Hunter Creek near Belmont

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
FEB , 1980												
05...	1730	5.27	10	360	6.4	9.0	5.0	9.8	84	4.3	130	110
MAR												
25...	1630	6.38	30	368	6.0	21.5	4.0	--	--	4.2	140	130
JUN												
04...	1340	5.78	21	430	6.2	27.0	5.0	4.5	55	2.2	130	120
AUG												
06...	1150	5.12	10	440	7.0	28.0	8.0	5.1	64	2.8	160	130
SEP												
30...	1230	4.13	.79	255	6.8	23.5	4.0	5.2	60	1.2	95	55
DEC												
02...	1530	5.02	8.3	167	7.3	12.0	--	8.6	79	1.4	54	39

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
FEB , 1980												
05...	34	10	14	19	.5	1.0	18	14	94	11	1.7	10
MAR												
25...	38	9.9	13	17	.5	1.0	4	7.8	120	9.4	1.8	9.8
JUN												
04...	33	11	17	22	.7	1.0	2	2.0	140	10	2.6	12
AUG												
06...	41	14	14	16	.5	1.3	28	5.5	130	11	2.5	17
SEP												
30...	24	8.6	9.2	17	.4	1.4	40	13	49	8.0	1.5	12
DEC												
02...	14	4.7	5.9	19	.3	.4	15	1.4	38	8.6	.7	8.8

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, DISSOLVED (TONS PER DAY)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)
FEB , 1980												
05...	261	187	.36	7.61	.36	.030	.39	2.500	.90	3.4	3.7	17
MAR												
25...	276	205	.38	22.4	.46	.080	.54	2.700	1.3	4.0	4.5	20
JUN												
04...	328	232	.45	19.1	.35	.040	.39	.380	1.3	1.6	2.0	9.2
AUG												
06...	285	248	.39	8.16	1.0	.060	1.0	.980	1.2	2.1	3.2	14
SEP												
30...	176	139	.24	.38	1.4	.040	1.4	.220	.43	.65	2.0	9.3
DEC												
02...	128	90	.17	2.87	.42	.030	.45	.620	.93	1.5	2.0	8.9

DATE	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, SUSPENDED RECOV. (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)	ANTIMONY, SUSPENDED TOTAL (UG/L AS SB)	ANTIMONY, DISSOLVED (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB , 1980												
05...	3.000	2.900	--	--	--	0	--	--	--	--	--	--
MAR												
25...	4.400	4.400	--	--	--	--	--	--	--	--	--	--
JUN												
04...	2.700	2.700	--	--	--	0	0	0	--	--	--	--
AUG												
06...	2.300	2.300	--	--	--	1	--	--	--	--	--	--
SEP												
30...	3.200	2.200	270	190	80	0	--	--	2	0	2	210
DEC												
02...	1.100	1.100	--	--	--	0	--	--	--	--	--	--

Table 3.--Chemical and physical parameters, January to December 1980, for Hunter Creek near Belmont--Continued

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
FEB , 1980 05...	--	--	--	--	--	--	--	--
MAR 25...	--	--	--	--	--	--	--	--
JUN 04...	--	--	--	--	--	--	--	--
AUG 06...	--	--	--	--	--	--	--	--
SEP 30...	150	60	3	2	1	20	10	10
DEC 02...	--	--	--	--	--	--	--	--

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	STRONTIUM, TOTAL RECOVERABLE (UG/L AS SR)	STRONTIUM, SUSPENDED RECOV. (UG/L AS SR)	STRONTIUM, DISSOLVED (UG/L AS SR)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980 05...	--	--	--	--	50	--	--	25
MAR 25...	--	--	--	--	60	.28	--	32
JUN 04...	--	--	90	40	50	--	--	16
AUG 06...	--	--	--	--	80	--	--	18
SEP 30...	<.1	0	--	--	30	.15	5	10
DEC 02...	--	--	--	--	20	--	--	28

Table 4.--Chemical and physical parameters, January to December 1980, for Deep Creek near Suwannee Valley

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
MAR , 1980												
25...	1815	5.85	134	48	5.9	20.5	1.0	--	--	.8	7	7
AUG												
07...	0950	3.55	30	68	4.4	27.0	--	--	--	--	10	10
DEC												
02...	0930	3.66	32	45	4.1	11.0	--	9.0	81	.9	12	12

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
MAR , 1980												
25...	1.1	.9	2.8	48	.5	.1	0	.0	9.7	6.5	.1	3.1
AUG												
07...	2.0	1.1	3.0	40	.4	.2	0	.0	11	7.9	.1	5.2
DEC												
02...	2.3	1.5	4.1	43	.5	.0	0	.0	7.4	9.0	.1	4.7

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)
MAR , 1980											
25...	97	25	.13	35.1	.00	.110	.11	.020	.88	.90	1.0
AUG											
07...	129	32	.18	10.5	.01	.020	.03	.020	1.5	1.5	1.5
DEC											
02...	93	34	.13	8.04	.00	.020	.02	.020	.85	.87	.89

DATE	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, SUS-PENDED RECOV. (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
MAR , 1980											
25...	4.5	.120	--	500	170	330	0	1	0	2	850
AUG											
07...	6.8	.130	.130	450	10	440	0	0	1	--	1200
DEC											
02...	3.8	.110	.110	390	10	380	0	0	0	2	600

Table 4.--Chemical and physical parameters, January to December 1980, for Deep Creek near Suwannee Valley--Continued

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
MAR , 1980							
25...	30	620	2	0	2	10	0
AUG							
07...	0	1200	6	3	3	10	0
DEC							
02...	70	530	3	3	0	20	0

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	STRONTIUM, DISSOLVED (UG/L AS SR)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
MAR , 1980							
25...	20	.3	3	40	.28	10	54
AUG							
07...	20	<.1	2	30	.12	10	64
DEC							
02...	20	<.1	1	7	.07	0	36

Table 5.--Chemical and physical parameters, January to December 1980, for Robinson Creek near Suwannee Valley

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, UNINHIB 5 DAY (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
MAR , 1980												
26...	0800	4.42	68	43	3.5	18.0	1.0	6.1	63	1.0	7	7
AUG												
07...	1105	3.10	21	58	4.1	27.5	3.0	5.6	72	--	10	--
DEC												
03...	1030	2.59	12	44	3.8	12.5	--	--	--	.4	15	14

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
MAR , 1980												
26...	1.1	.9	2.9	49	.5	.1	0	.0	13	10	.1	2.5
AUG												
07...	2.0	1.1	2.8	38	.4	.2	--	--	10	7.4	.1	3.4
DEC												
03...	3.2	1.6	4.1	37	.5	.1	1	254	7.9	9.7	.1	7.3

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, DISSOLVED (TONS PER DAY)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)
MAR , 1980											
26...	94	23	.03	17.4	.00	.020	.02	.010	.94	.95	.97
AUG											
07...	121	--	.16	7.12	.00	.020	.02	.020	1.1	1.1	1.1
DEC											
03...	101	36	.14	3.49	.02	.020	.04	.020	1.0	1.0	1.0

DATE	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, SUSPENDED RECOV. (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ANTIMONY, TOTAL (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
MAR , 1980											
26...	4.3	.080	.080	600	230	370	0	1	0	4	650
AUG											
07...	5.0	.100	.100	430	0	430	0	1	1	5	1200
DEC											
03...	4.7	.130	.130	420	40	380	2	0	0	1	640

Table 5.--Chemical and physical parameters, January to December 1980, for Robinson Creek near Suwannee Valley--Continued

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)
MAR , 1980							
26...	100	550	4	2	2	20	10
AUG							
07...	200	1000	7	1	6	20	10
DEC							
03...	0	850	1	1	0	30	10

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	STRONTIUM, DISSOLVED (UG/L AS SR)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
MAR , 1980							
26...	10	.3	1	50	.11	10	50
AUG							
07...	10	.3	2	30	.12	10	60
DEC							
03...	20	<.1	1	9	.07	20	44

Table 6.--Chemical and physical parameters, January to December 1980, for Suwannee River at White Springs

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB , 1980										
06...	1445	7.35	1590	60	3.4	7.0	2.0	11.8	96	.2
MAR										
26...	1546	14.58	4230	52	3.3	20.0	1.0	7.6	85	.3
JUN										
03...	1450	7.18	1530	58	4.1	26.0	.00	6.0	73	.0
AUG										
05...	0930	4.07	533	65	4.4	28.5	2.0	6.4	81	.3
OCT										
02...	1500	2.20	124	88	5.5	25.0	1.0	5.9	70	.3
DEC										
03...	1400	5.62	993	44	3.9	13.0	--	--	--	.6

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
FEB , 1980									
06...	.01	.010	.02	.060	.64	.70	.72	3.2	.070
MAR									
26...	.00	.020	.02	.020	1.0	1.0	1.0	4.6	.130
JUN									
03...	.02	.020	.04	.010	1.3	1.3	1.3	6.0	.180
AUG									
05...	.04	.020	.06	.030	1.1	1.1	1.1	5.3	.230
OCT									
02...	.19	.010	.20	.020	1.2	1.2	1.4	6.3	.300
DEC									
03...	.02	.010	.03	.020	.82	.84	.87	3.9	.160

DATE	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, SUS-PENDED RECOV. (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
FEB , 1980								
06...	.070	--	--	--	--	--	--	--
MAR								
26...	.120	--	--	--	--	--	--	--
JUN								
03...	.160	--	--	--	--	--	--	--
AUG								
05...	.230	--	--	--	--	--	--	--
OCT								
02...	.300	190	30	160	1	0	2	430
DEC								
03...	.150	--	--	--	--	--	--	--

DATE	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT , 1980											
02...	90	340	2	2	0	20	10	10	.1	2	4

Table 7.--Chemical and physical parameters, January to December 1980, for Swift Creek at Facil

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
FEB , 1980												
06...	1600	2.07	64	620	6.4	12.0	18	8.1	74	9.5	190	180
MAR												
26...	1230	2.72	98	565	6.1	20.0	8.0	4.3	46	8.2	170	--
JUN												
04...	1000	2.49	81	410	6.7	26.0	6.0	--	--	5.0	110	87
AUG												
06...	0930	1.98	53	420	7.1	28.0	9.0	3.4	43	3.2	140	83
OCT												
02...	0945	1.65	42	455	6.6	26.5	4.0	4.0	49	6.9	160	110
DEC												
03...	1245	1.58	43	722	5.8	15.0	--	--	--	6.9	180	170

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
FEB , 1980												
06...	49	17	44	33	1.4	4.4	11	8.5	200	16	19	19
MAR												
26...	46	13	43	35	1.4	4.1	2	3.1	190	12	5.0	15
JUN												
04...	26	12	20	27	.8	1.1	16	6.4	92	14	3.9	13
AUG												
06...	34	14	21	24	.8	1.5	47	9.3	98	14	3.0	17
OCT												
02...	39	16	26	26	.9	1.4	56	29	110	15	3.6	17
DEC												
03...	46	16	59	41	1.9	3.7	15	46	190	17	6.3	19

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)
FEB , 1980												
06...	451	375	.61	78.8	2.3	.120	2.4	7.400	3.6	11	13	59
MAR												
26...	337	--	--	89.7	2.1	.240	2.3	8.400	3.4	9.8	12	54
JUN												
04...	327	198	.44	71.5	3.0	.200	3.2	2.700	.80	3.5	6.7	30
AUG												
06...	277	239	.38	39.7	1.3	.120	1.4	2.000	1.1	3.1	4.5	20
OCT												
02...	323	264	.44	36.9	3.4	.180	3.5	.010	.69	.70	4.2	19
DEC												
03...	435	366	.59	50.6	3.6	.440	4.0	7.300	3.3	10	14	65

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, SUS-PENDED RECOV. (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ANTI-MONY, TOTAL (UG/L AS SB)	ANTI-MONY, SUS-PENDED TOTAL (UG/L AS SB)	ANTI-MONY, DIS-SOLVED (UG/L AS SB)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
FEB , 1980												
06...	20.000	19.000	--	--	--	1	--	--	--	--	--	--
MAR												
26...	13.000	13.000	--	--	--	--	--	--	--	--	--	--
JUN												
04...	6.000	6.000	--	--	--	0	0	0	--	--	--	--
AUG												
06...	3.400	3.400	--	--	--	1	--	--	--	--	--	--
OCT												
02...	9.800	6.400	330	270	60	0	--	--	3	0	2	240
DEC												
03...	18.000	13.000	--	--	--	2	--	--	--	--	--	--

Table 7.--Chemical and physical parameters, January to December 1980, for Swift Creek at Facil--Continued

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)
FEB , 1980								
06...	--	--	--	--	--	--	--	--
MAR								
26...	--	--	--	--	--	--	--	--
JUN								
04...	--	--	--	--	--	--	--	--
AUG								
06...	--	--	--	--	--	--	--	--
OCT								
02...	190	50	2	1	1	40	20	20
DEC								
03...	--	--	--	--	--	--	--	--

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	STRONTIUM, TOTAL RECOVERABLE (UG/L AS SR)	STRONTIUM, SUSPENDED RECOV. (UG/L AS SR)	STRONTIUM, DISSOLVED (UG/L AS SR)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980								
06...	--	--	--	--	80	--	--	16
MAR								
26...	--	--	--	--	80	.19	--	30
JUN								
04...	--	--	100	50	50	--	--	16
AUG								
06...	--	--	--	--	80	--	--	19
OCT								
02...	<.1	2	--	--	70	.55	3	15
DEC								
03...	--	--	--	--	80	--	--	16

Table 8.--Chemical and physical parameters, January to December 1980, for Rocky Creek near Houston

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
FEB , 1980												
05...	1230	4.39	13	50	4.6	6.0	1.0	13.7	109	.8	14	10
MAR												
26...	1645	4.66	19	42	4.5	20.0	1.0	7.2	78	1.2	11	4
JUN												
03...	1315	3.40	2.9	48	5.2	23.0	.00	6.9	79	.9	--	--
AUG												
07...	1205	3.82	7.8	52	5.0	28.0	2.0	7.0	88	--	15	--
SEP												
29...	1500	3.36	.00	--	--	--	--	--	--	--	--	--
DEC												
01...	1630	3.88	9.7	50	5.4	12.0	--	9.5	87	.7	19	14

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
FEB , 1980												
05...	3.3	1.4	3.4	34	.4	.3	4	--	5.8	9.1	.2	4.4
MAR												
26...	2.3	1.3	3.0	36	.4	.5	7	--	6.2	8.1	.1	2.5
JUN												
03...	--	--	--	--	--	--	--	--	--	--	.2	--
AUG												
07...	3.5	1.4	3.2	31	.4	.6	7	--	7.8	8.6	.2	4.9
SEP												
29...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
01...	4.3	2.0	5.2	36	.5	.6	5	38	6.8	11	.1	7.8

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
FEB , 1980								
05...	68	30	.09	2.44	.04	.010	.05	.020
MAR								
26...	74	28	.10	3.84	.04	.020	.06	.010
JUN								
03...	--	--	--	--	.07	.020	.09	.030
AUG								
07...	85	--	.12	1.79	.14	.020	.16	.050
DEC								
01...	79	41	.11	2.08	.00	.020	.02	.020

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS P)	ANTI-MONY, TOTAL (UG/L AS SB)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980										
05...	.50	.52	.57	2.5	.140	.130	0	7	--	23
MAR										
26...	.89	.90	.98	4.2	.300	.270	--	30	.22	32
JUN										
03...	1.0	1.0	1.1	5.0	.390	.380	--	--	--	27
AUG										
07...	1.2	1.2	1.4	6.2	.320	.310	0	40	--	32
DEC										
01...	.74	.76	.78	3.5	.230	.230	0	10	--	26

Table 9.--Chemical and physical parameters, January to December 1980, for Camp Branch near Genoa

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
FEB , 1980 06...	1745	13.16	2.0	92	5.5	9.0	1.0	11.2	96	1.8	37	25
MAR 26...	1045	13.33	5.5	55	4.6	17.0	1.0	7.0	71	1.7	28	20
JUN 04...	1130	13.05	.00	--	--	--	--	--	--	--	--	--
SEP 29...	1430	13.05	.00	--	--	--	--	--	--	--	--	--
DEC 01...	1300	13.25	4.1	77	6.4	11.0	--	9.0	81	1.3	36	29

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
FEB , 1980 06...	8.2	4.0	5.8	25	.4	.1	12	--	9.3	12	.3	12
MAR 26...	6.3	2.9	4.7	27	.4	.2	8	--	12	9.9	.3	4.8
JUN 04...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 29...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 01...	7.6	4.2	7.3	30	.5	.3	7	5.1	18	10	.2	12

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
FEB , 1980 06...	154	59	.21	.85	.00	.010	.01	.040
MAR 26...	162	46	.22	2.44	.01	.020	.03	.000
DEC 01...	143	64	.19	1.60	.00	.010	.01	.010

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS P)	ANTI-MONY, TOTAL (UG/L AS SB)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980 06...	1.2	1.2	1.2	5.5	.090	.080	0	20	56
MAR 26...	1.6	1.6	1.6	7.2	.250	.230	--	10	66
DEC 01...	1.2	1.2	1.2	5.4	.190	.190	0	20	44

Table 10.--Chemical and physical parameters, January to December 1980, for Suwannee River at Suwannee Springs

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	FLUORIDE, DISSOLVED (MG/L AS F)
FEB , 1980											
05...	0930	44.96	2060	65	4.5	7.0	2.0	10.6	87	1.0	.4
MAR											
27...	1330	54.65	4050	55	4.1	20.0	1.0	6.8	74	1.0	.3
JUN											
03...	1200	44.30	1660	75	5.8	24.0	1.0	5.9	69	1.4	.3
AUG											
05...	1050	40.78	693	129	6.6	28.5	2.0	5.9	75	1.6	.5
SEP											
30...	1500	38.25	197	200	7.2	26.0	2.0	4.9	59	.2	.7
DEC											
01...	1445	41.92	993	72	5.8	13.0	--	8.9	83	.8	.7

DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
FEB , 1980									
05...	.13	.020	.15	.180	.67	.85	1.0	4.4	.630
MAR									
27...	.06	.020	.08	.280	1.1	1.3	1.4	6.5	.410
JUN									
03...	.29	.030	.32	.040	1.1	1.1	1.4	6.5	.440
AUG									
05...	.22	.020	.24	.100	1.2	1.3	1.5	6.8	.520
SEP									
30...	.57	.010	.58	.040	.41	.45	1.0	4.6	1.600
DEC									
01...	.41	.030	.44	.230	.84	1.0	1.5	6.7	.860

DATE	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, SUSPENDED RECOV. (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB , 1980								
05...	.590	--	--	--	--	--	--	--
MAR								
27...	.390	--	--	--	--	--	--	--
JUN								
03...	.400	--	--	--	--	--	--	--
AUG								
05...	.520	--	--	--	--	--	--	--
SEP								
30...	1.200	150	60	90	2	0	2	270
DEC								
01...	.860	--	--	--	--	--	--	--

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980												
05...	--	--	--	--	--	--	--	--	--	--	--	39
MAR												
27...	--	--	--	--	--	--	--	--	--	--	--	44
JUN												
03...	--	--	--	--	--	--	--	--	--	--	--	37
AUG												
05...	--	--	--	--	--	--	--	--	--	--	--	33
SEP												
30...	70	200	0	0	0	10	0	10	<.1	1	0	19
DEC												
01...	--	--	--	--	--	--	--	--	--	--	--	31

Table 11.--Chemical and physical parameters, January to December 1980, for Withlacoochee River near Pinetta

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB , 1980											
04...	1015	13.62	4530	60	6.3	7.0	14	10.6	87	1.3	.1
MAR											
24...	1400	23.22	10200	46	6.6	18.0	20	7.7	80	1.4	.2
JUN											
03...	1000	6.90	1260	140	6.7	24.0	10	5.0	58	1.1	.2
AUG											
05...	1200	7.08	281	260	7.3	26.5	4.0	3.4	41	.9	.2
SEP											
29...	1200	6.80	190	370	7.2	24.5	2.0	6.1	72	.5	.3
DEC											
01...	1030	6.98	250	270	7.4	14.5	--	5.3	51	1.2	.4

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
FEB , 1980									
04...	.05	.020	.07	.030	.65	.68	.75	3.3	.090
MAR									
24...	.04	.020	.06	.010	.62	.63	.69	3.1	.090
JUN									
03...	.31	.020	.33	.060	2.0	2.0	2.3	11	.160
AUG									
05...	.28	.010	.29	.080	.64	.72	1.0	4.5	.160
SEP									
29...	.32	.020	.34	.080	.16	.24	.58	2.6	.230
DEC									
01...	.31	.020	.33	.060	.54	.60	.93	4.1	.300

DATE	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, SUS-PENDED RECOV. (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
FEB , 1980								
04...	.070	--	--	--	--	--	--	--
MAR								
24...	.070	--	--	--	--	--	--	--
JUN								
03...	.150	--	--	--	--	--	--	--
AUG								
05...	.160	--	--	--	--	--	--	--
SEP								
29...	.220	100	20	80	1	0	3	200
DEC								
01...	.300	--	--	--	--	--	--	--

DATE	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980												
04...	--	--	--	--	--	--	--	--	--	--	--	18
MAR												
24...	--	--	--	--	--	--	--	--	--	--	--	24
JUN												
03...	--	--	--	--	--	--	--	--	--	--	--	17
AUG												
05...	--	--	--	--	--	--	--	--	--	--	--	14
SEP												
29...	110	90	2	0	2	30	0	30	<.1	2	2	9.4
DEC												
01...	--	--	--	--	--	--	--	--	--	--	--	13

Table 12.--Chemical and physical parameters, January to December 1980, for Suwannee River at Branford

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
JAN , 1980												
03...	1500	7.30	4840	195	7.0	15.0	7.1	69	K11	K6	90	22
FEB												
06...	1100	11.07	8000	78	6.3	9.0	10.2	--	38	25	24	12
MAR												
09...	1300	10.85	7800	150	6.8	16.0	7.8	--	35	K23	64	13
29...	1700	20.21	18800	64	5.8	18.0	6.1	--	K20	K22	21	2
MAY												
02...	1320	18.58	16400	121	6.4	20.0	5.0	--	K14	K7	63	13
28...	1145	12.02	8910	200	6.6	23.5	5.3	--	K13	K14	87	19
JUN												
24...	1145	8.02	5420	290	7.1	24.0	6.0	--	160	K44	140	15
JUL												
24...	1300	6.15	3960	302	6.8	25.0	5.8	--	K50	K24	150	18
AUG												
28...	1450	6.53	4320	325	6.9	25.5	5.8	--	--	--	150	33
SEP												
22...	1545	5.43	3430	330	7.8	26.0	6.5	--	K46	K2	160	28
OCT												
30...	1315	5.22	3160	298	7.8	21.0	7.0	--	100	K28	140	24
NOV												
13...	1330	5.25	3295	286	7.7	18.5	5.0	--	K10	<2	130	18
DEC												
03...	1300	5.71	3630	245	7.5	17.0	6.4	--	K8	K4	110	20

DATE	CALCIUM DISSOLVED (MG/L AS CA)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORPTION RATIO	SODIUM+ POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
JAN , 1980												
03...	27	7.7	20	.4	8.6	.9	68	15	7.4	.3	8.6	139
FEB												
06...	6.7	5.0	30	.4	6.2	1.2	12	7.5	8.3	.1	6.8	62
MAR												
09...	20	4.7	14	.3	5.3	.6	51	8.3	7.2	.1	5.6	108
29...	6.1	4.2	29	.4	--	1.3	19	6.3	6.7	.1	4.3	82
MAY												
02...	20	3.7	11	.2	--	.9	50	6.0	6.5	.2	4.7	104
28...	27	4.5	10	.2	--	.6	68	10	6.3	.2	5.9	137
JUN												
24...	42	5.5	8	.2	--	.6	120	11	5.7	.2	6.9	160
JUL												
24...	46	3.2	4	.1	--	.4	130	18	5.3	.2	6.8	188
AUG												
28...	47	5.6	7	.2	--	.6	120	20	5.7	.3	8.5	200
SEP												
22...	48	4.7	6	.2	--	.5	130	20	5.6	.2	8.9	183
OCT												
30...	43	5.4	8	.2	--	.5	120	21	5.7	.2	8.3	193
NOV												
13...	38	8.0	12	.3	--	.7	110	20	6.9	.2	8.0	189
DEC												
03...	31	6.3	11	.3	--	.5	--	18	6.3	.2	8.3	164

Table 12.--Chemical and physical parameters, January to December 1980, for Suwannee River at Branford--Continued

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
JAN , 1980												
03...	115	.19	1320	.50	.020	.52	.46	.100	.100	.12	.13	.52
FEB												
06...	46	.11	1770	.10	.010	.11	.10	.060	.070	.07	.09	.59
MAR												
09...	82	.15	2270	.33	.010	.34	.34	.030	.000	.04	.00	.92
29...	42	.11	4160	--	--	.09	.10	.050	.070	.06	.09	.67
MAY												
02...	77	.14	4610	.30	.010	.31	.33	.060	.040	.07	.05	.57
28...	102	.19	3300	--	--	.53	.53	.040	.020	.05	.03	.72
JUN												
24...	156	.22	2340	--	--	.96	.95	.010	.040	.01	.05	.20
JUL												
24...	170	.26	2010	--	--	.87	.87	.000	.000	.00	.00	.14
AUG												
28...	173	.27	2330	--	--	.78	1.1	.030	.040	.04	.05	.30
SEP												
22...	180	.25	1690	1.0	.000	1.0	1.0	.000	.000	.00	.00	.14
OCT												
30...	169	.26	1650	.90	.010	.91	.91	.050	.040	.06	.05	.22
NOV												
13...	160	.26	1680	--	--	.97	.97	.100	.110	.12	.14	.35
DEC												
03...	133	.22	1610	.75	.020	.77	.77	.000	.020	.00	.03	.50

DATE	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN,NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS PO4)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
JAN , 1980											
03...	.49	.62	1.1	.03	.59	1.1	5.0	1.300	3.1	4.0	1.300
FEB											
06...	.54	.65	.71	.04	.61	.76	3.4	.210	.43	.64	.160
MAR											
09...	.75	.95	1.1	.20	.75	1.3	5.7	.220	.49	.67	.190
29...	.60	.72	.77	.05	.67	.81	3.6	.190	--	.58	.140
MAY											
02...	.56	.63	.93	.03	.60	.94	4.2	.220	.34	.67	.140
28...	.35	.76	.90	.39	.37	1.3	5.7	.200	--	.61	.150
JUN											
24...	.11	.21	1.1	.06	.15	1.2	5.2	.220	--	.67	.110
JUL											
24...	.07	.14	.94	.07	.07	1.0	4.5	.110	--	.34	.100
AUG											
28...	.19	.33	1.3	.10	.23	1.1	4.9	.170	--	.52	.170
SEP											
22...	.09	.14	1.1	.05	.09	1.1	5.0	.170	.37	.52	.150
OCT											
30...	.14	.27	1.1	.09	.18	1.2	5.2	.220	.67	.67	.210
NOV											
13...	.24	.45	1.3	.10	.35	1.4	6.3	.290	--	.89	.270
DEC											
03...	.28	.50	1.1	.20	.30	1.3	5.6	.350	.95	1.1	.320

Table 12.--Chemical and physical parameters, January to December 1980, for Suwannee River at Branford--Continued

DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
JAN , 1980											
03...	--	--	--	--	--	--	--	--	--	--	--
FEB											
06...	1	1	0	100	90	10	0	0	3	10	0
MAR											
09...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
MAY											
02...	1	1	0	<50	--	40	0	0	7	10	0
28...	--	--	--	--	--	--	--	--	--	--	--
JUN											
24...	--	--	--	--	--	--	--	--	--	--	--
JUL											
24...	1	1	0	100	70	30	0	0	2	10	0
AUG											
28...	--	--	--	--	--	--	--	--	--	--	--
SEP											
22...	--	--	--	--	--	--	--	--	--	--	--
OCT											
30...	--	--	--	--	--	--	--	--	--	--	--
NOV											
13...	--	--	--	--	--	--	--	--	--	--	--
DEC											
03...	1	1	0	<50	--	10	0	0	0	10	--

Table 13.--Chemical and physical parameters, January to December 1980, for Santa Fe River at Worthington Springs

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
MAY , 1979											
10...	1220	10.65	245	94	6.0	23.0	7.2	50	240	32	18
30...	1250	8.73	80	90	6.0	23.0	6.8	47	80	32	14
JUN											
26...	1250	7.93	35	125	6.9	25.0	6.3	37	100	41	15
JUL											
25...	1530	7.55	19	105	7.0	27.5	7.4	55	K20	58	17
AUG											
31...	0720	13.55	594	58	5.3	25.5	4.8	110	400	20	12
OCT											
05...	1145	16.70	1780	53	5.0	22.0	5.8	33	K36	18	11
NOV											
12...	1015	9.12	107	100	6.4	20.0	7.2	130	64	39	7
DEC											
09...	1800	14.11	712	70	5.3	14.0	--	K370	90	--	--
JAN , 1980											
04...	1020	10.62	242	102	6.5	10.0	9.8	130	K20	30	12
FEB											
07...	1220	13.80	642	65	5.0	9.0	10.2	30	25	22	15
MAR											
09...	1820	12.72	480	72	5.8	18.0	6.5	>200	K200	21	11
29...	0900	13.10	531	70	5.2	19.0	6.2	79	29	21	16
MAY											
02...	1700	10.69	232	64	5.8	19.0	6.8	39	25	24	16
27...	1735	11.01	282	87	5.8	23.0	6.5	75	95	28	18
JUN											
24...	1545	8.53	60	146	6.3	26.5	6.2	160	280	51	14
JUL											
25...	0930	10.89	270	103	5.7	24.0	5.9	>600	K2600	38	23
AUG											
29...	0930	10.45	224	78	5.7	25.0	5.7	--	--	28	15
SEP											
23...	0900	7.95	36	140	6.8	25.0	6.1	120	76	52	23
NOV											
14...	0915	7.32	12	230	7.4	15.0	5.8	K37	K8	75	17

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
MAY , 1979											
10...	7.8	7.1	32	.5	--	.7	14	7.4	12	.1	5.3
30...	7.9	8.1	35	.6	--	.6	18	13	12	.1	4.9
JUN											
26...	10	9.2	32	.6	--	.8	26	14	12	.1	4.3
JUL											
25...	14	11	29	.6	12	1.0	41	12	14	.2	5.4
AUG											
31...	5.0	3.5	26	.3	4.3	.8	8	8.0	6.5	.1	4.7
OCT											
05...	4.7	4.1	32	.4	5.2	1.1	7	8.3	7.4	.1	5.0
NOV											
12...	9.6	8.5	42	.6	9.6	1.1	32	14	11	.2	6.4
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
JAN , 1980											
04...	7.5	7.5	45	.6	8.3	.8	18	12	11	.1	5.4
FEB											
07...	5.5	6.4	38	.6	7.1	.7	7	9.7	10	.1	4.7
MAR											
09...	5.3	5.5	35	.5	6.6	.9	10	6.1	9.7	.1	2.5
29...	5.6	5.5	35	.5	--	.9	5	11	9.2	.1	2.9
MAY											
02...	6.1	5.4	32	.5	--	.7	6	8.3	9.5	.1	3.8
27...	7.0	5.8	38	.5	--	.8	10	8.0	10	.1	4.8
JUN											
24...	12	8.9	27	.5	--	1.4	37	8.8	12	.3	6.9
JUL											
25...	9.3	5.4	23	.4	--	1.0	15	16	9.8	.1	5.4
AUG											
29...	7.0	4.8	26	.4	--	.9	13	8.8	9.6	.2	5.9
SEP											
23...	13	7.3	23	.4	--	1.5	29	9.9	12	.2	7.2
NOV											
14...	18	11	24	.6	--	1.6	--	13	18	.4	5.9

Table 13.--Chemical and physical parameters, January to December 1980, for Santa Fe River at Worthington Springs--Continued

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS NH4)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)
MAY , 1979											
10...	112	52	.15	74.1	.17	--	.000	--	.00	--	1.1
30...	113	60	.15	24.4	.16	--	.030	--	.04	--	.89
JUN											
26...	107	70	.15	10.1	.16	--	.010	--	.01	--	.64
JUL											
25...	123	88	.17	6.41	.25	--	.000	--	.00	--	.55
AUG											
31...	18	35	.02	28.9	.02	--	.010	--	.01	--	1.2
OCT											
05...	106	37	.14	509	.01	.03	.100	.030	.22	.04	1.1
NOV											
12...	111	75	.15	32.1	.17	.14	.030	.040	.04	.05	.75
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
JAN , 1980											
04...	100	58	.14	65.3	.12	.06	.010	.000	.01	.00	.83
FEB											
07...	88	44	.12	153	.05	.03	.040	.060	.05	.08	.68
MAR											
09...	88	40	.12	111	.04	.07	.040	.010	.05	.01	.70
29...	98	40	.13	141	.08	.08	.010	.040	.01	.05	.84
MAY											
02...	96	42	.13	58.9	.18	.17	.030	.030	.04	.04	.65
27...	98	46	.13	74.6	.18	.18	.050	.020	.06	.03	.86
JUN											
24...	91	79	.12	16.7	.47	.50	.040	.060	.05	.08	.60
JUL											
25...	117	61	.16	65.3	.20	.16	--	.010	--	.01	--
AUG											
29...	112	48	.15	67.7	.12	.12	--	.030	--	.04	--
SEP											
23...	104	76	.14	10.2	.25	.25	.010	.000	.01	.00	.38
NOV											
14...	133	113	.18	4.31	.50	.50	.020	.010	.02	.01	.39

DATE	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, DIS- SOLVED (MG/L AS N)	NITRO- GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC DIS. (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHOPH OSPHATE TOTAL (MG/L AS PO4)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
MAY , 1979											
10...	--	1.1	--	.20	.90	1.3	5.6	.300	.92	.92	.260
30...	--	.92	--	.02	.90	1.1	4.8	.210	.64	.64	.190
JUN											
26...	--	.65	--	.00	.65	.81	3.7	.310	.95	.95	.290
JUL											
25...	--	.55	--	.04	.51	.80	3.5	.540	--	1.7	.520
AUG											
31...	--	1.2	--	.34	.86	1.2	5.4	.180	--	.55	.170
OCT											
05...	1.2	1.3	1.2	.10	1.2	1.3	5.8	.190	--	.58	.170
NOV											
12...	.68	.78	.86	.06	.72	.95	4.2	.210	--	.64	.200
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
JAN , 1980											
04...	.64	.84	.70	.20	.64	.96	4.3	.160	--	.49	.140
FEB											
07...	.61	.72	.70	.05	.67	.77	3.4	.040	--	.12	.090
MAR											
09...	.67	.74	.75	.06	.68	.78	3.5	.120	--	.37	.150
29...	.67	.85	.79	.14	.71	.93	4.1	.180	--	.55	.140
MAY											
02...	.62	.68	.82	.03	.65	.86	3.8	.220	--	.67	.180
27...	.64	.91	.84	.25	.66	1.1	4.8	.240	--	.74	.200
JUN											
24...	.26	.64	.82	.32	.32	1.1	4.9	.440	--	1.4	.400
JUL											
25...	.57	--	.74	--	.58	--	--	.260	--	.80	.190
AUG											
29...	.61	--	.76	--	.64	--	--	.210	--	.64	.190
SEP											
23...	.61	.39	.86	.00	.61	.64	2.8	.410	--	1.3	.370
NOV											
14...	.34	.41	.85	.06	.35	.91	4.0	.640	--	2.0	.620

Table 13.--Chemical and physical parameters, January to December 1980, for Santa Fe River at Worthington Springs--Continued

DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
MAY , 1979											
10...	1	4	--	0	0	0	0	0	0	20	0
30...	--	--	--	--	--	--	--	--	--	--	--
JUN											
26...	--	--	--	--	--	--	--	--	--	--	--
JUL											
25...	1	4	--	0	0	10	1	0	1	10	0
AUG											
31...	--	--	--	--	--	--	--	--	--	--	--
OCT											
05...	--	--	--	--	--	--	--	--	--	--	--
NOV											
12...	2	3	1	0	0	20	0	0	2	10	0
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
JAN , 1980											
04...	--	--	--	--	--	--	--	--	--	--	--
FEB											
07...	1	0	0	<50	<50	20	0	0	0	10	0
MAR											
09...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
MAY											
02...	1	1	0	<50	--	20	0	0	6	20	10
27...	--	--	--	--	--	--	--	--	--	--	--
JUN											
24...	--	--	--	--	--	--	--	--	--	--	--
JUL											
25...	1	1	0	100	70	30	0	0	0	10	0
AUG											
29...	--	--	--	--	--	--	--	--	--	--	--
SEP											
23...	--	--	--	--	--	--	--	--	--	--	--
NOV											
14...	0	1	1	100	80	20	0	0	1	10	0

Table 14.--Chemical and physical parameters, January to December 1980, for Suwannee River near Wilcox

DATE	TIME	STREAM STAGE (FT ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	FLUORIDE, DISSOLVED (MG/L AS F)
FEB , 1980											
06...	1000	5.36	10300	110	6.5	11.0	1.0	10.2	92	1.4	.2
MAR											
27...	1615	9.92	22300	60	5.5	20.0	6.0	5.5	59	1.2	.2
JUN											
05...	1030	5.93	10600	245	7.1	24.0	3.0	5.3	62	1.1	.1
AUG											
04...	1230	5.18	8170	245	7.3	27.0	3.0	5.4	67	1.0	--
OCT											
01...	1230	3.66	5240	320	7.2	25.0	1.0	5.4	64	.6	.2
DEC											
04...	1300	2.48	3610	290	7.8	19.0	--	8.0	85	.7	.4

DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
FEB , 1980									
06...	.18	.010	.19	.070	.55	.62	.81	3.6	.220
MAR									
27...	.05	.020	.07	.020	.83	.85	.92	4.1	.190
JUN									
05...	.35	.010	.36	.010	.53	.54	.90	4.0	.170
AUG									
04...	.56	.010	.57	.030	2.9	2.9	3.5	15	.170
OCT									
01...	.84	.010	.85	.040	.00	.04	.89	3.9	.140
DEC									
04...	.73	.010	.74	.040	.26	.30	1.0	4.6	.200

Table 14.--Chemical and physical parameters, January to December 1980, for Suwannee River near Wilcox--Continued

DATE	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, SUSPENDED RECOV. (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB , 1980								
06...	.180	--	--	--	--	--	--	--
MAR								
27...	.150	--	--	--	--	--	--	--
JUN								
05...	.130	--	--	--	--	--	--	--
AUG								
04...	.150	--	--	--	--	--	--	--
OCT								
01...	.120	90	30	60	2	0	2	140
DEC								
04...	.260	--	--	--	--	--	--	--

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB , 1980												
06...	--	--	--	--	--	--	--	--	--	--	--	20
MAR												
27...	--	--	--	--	--	--	--	--	--	--	--	32
JUN												
05...	--	--	--	--	--	--	--	--	--	--	--	10
AUG												
04...	--	--	--	--	--	--	--	--	--	--	--	18
OCT												
01...	110	30	0	0	1	10	4	6	.1	6	5	4.0
DEC												
04...	--	--	--	--	--	--	--	--	--	--	--	10

Table 15.--Maximum, minimum, and mean values for chemical, biological, and physical parameters for all sampling locations from November 1968 to December 1980

[K indicates number of samples analyzed]

STATION NUMBER		STREAM-FLOW, INSTAN-TANEOUS (CFS)	PH FIELD (UNITS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	CARBON, ORGANIC TOTAL (MG/L AS C)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)
02314986	MAXIMUM	2340	7.4	160	28.0	10.8	2.3	90	100	4.9	.03
	MINIMUM	.00	3.1	24	4.0	3.7	.0	35	4.0	.26	.00
	MEAN	84	4.3	80	18.3	6.6	.6	67	57	1.2	.00
	K	65	62.0	62	62.0	61.0	53	54	58	63	58
02315000	MAXIMUM	6330	6.9	90	31.0	12.0	1.7	95	48	1.6	.04
	MINIMUM	10	3.1	35	5.5	5.1	.1	54	16	.37	.00
	MEAN	1536	4.2	51	20.0	7.6	.5	80	36	.79	.00
	K	36	39.0	39	39.0	34.0	33	32	32	34	33
02315005	MAXIMUM	425	8.1	630	28.0	11.4	8.1	94	52	2.5	3.6
	MINIMUM	.34	3.5	34	7.0	2.6	.0	32	6.0	.22	.00
	MEAN	24	6.5	228	19.3	6.4	2.4	68	19	.95	.60
	K	69	70.0	70	70.0	61.0	56	52	63	66	64
02315200	MAXIMUM	466	7.2	225	27.0	12.3	3.1	101	64	1.5	.24
	MINIMUM	.35	3.6	40	5.0	4.3	.8	41	10	.50	.00
	MEAN	64	5.2	74	18.6	7.6	1.4	75	40	.82	.03
	K	28	28.0	28	28.0	23.0	6.0	20	19	19	19
02315392	MAXIMUM	221	7.8	210	27.5	11.0	1.5	99	60	1.4	.11
	MINIMUM	.16	3.5	30	4.5	4.2	.2	46	2.7	.15	.00
	MEAN	29	5.4	90	18.4	6.8	.7	68	37	.80	.03
	K	29	29.0	29	29.0	23.0	7.0	20	20	20	20
02315500	MAXIMUM	11500	7.4	135	29.5	11.8	5.2	113	63	1.4	.27
	MINIMUM	20	3.3	31	6.5	4.3	.1	64	14	.16	.00
	MEAN	1777	4.7	53	20.5	7.5	.9	81	33	.79	.03
	K	59	59.0	58	58.0	51.0	22	44	16	48	57
02315520	MAXIMUM	1180	7.1	900	29.0	10.8	10	100	52	7.9	6.3
	MINIMUM	7.5	3.7	133	7.0	2.8	.4	34	.0	.00	.01
	MEAN	86	6.1	500	20.3	5.5	4.9	57	19	1.2	1.9
	K	78	80.0	79	80.0	73.0	67	61	72	72	77
02315532	MAXIMUM	56	5.5	65	28.0	13.7	1.2	109	54	1.3	.14
	MINIMUM	.00	4.5	42	6.0	5.9	.3	67	23	.50	.00
	MEAN	13	4.9	52	18.4	8.2	.9	82	30	.91	.04
	K	14	11.0	11	11.0	11.0	10	11	10	11	11
02315542	MAXIMUM	10	6.8	180	26.0	11.2	1.8	96	84	1.9	.03
	MINIMUM	.00	4.6	55	8.5	4.3	.6	46	18	.40	.00
	MEAN	1.8	6.0	110	17.2	7.0	1.3	69	47	1.1	.00
	K	13	9.0	9	9.0	9.0	9.0	9	7.0	9.0	9.0
02315550	MAXIMUM	11300	7.5	390	29.0	11.5	5.5	96	50	1.8	1.5
	MINIMUM	91	3.6	39	7.0	4.4	.2	47	6.8	.11	.00
	MEAN	2227	5.8	106	20.4	7.1	1.1	76	29	.74	.20
	K	72	73.0	73	73.0	66.0	68	57	61	64	66
02319000	MAXIMUM	21500	8.3	510	29.0	11.5	4.2	100	26	2.2	.64
	MINIMUM	93	4.5	25	6.5	2.7	.3	32	6.5	.10	.00
	MEAN	2175	6.8	168	19.4	6.0	1.5	63	14	.64	.21
	K	121	88.0	101	112	68.0	65	58	58	83	69
02320500	MAXIMUM	43300	8.2	380	28.0	10.2	3.1	88	33	1.4	1.0
	MINIMUM	1600	5.1	37	7.5	3.5	.0	40	.0	.00	.00
	MEAN	7288	7.1	195	20.2	6.5	.8	70	14	.44	.36
	K	160	123	136	144	101	68	67	83	118	87
02321500	MAXIMUM	2600	8.0	235	29.0	10.2	8.0	81	43	2.1	.43
	MINIMUM	11	5.0	28	7.0	3.2	.0	38	8.0	.27	.00
	MEAN	380	6.3	92	20.9	6.4	1.1	65	23	.80	.09
	K	47	65.0	78	94.0	48.0	20	22	24	53	28
02323500	MAXIMUM	25700	8.4	360	28.0	10.4	2.1	98	36	2.9	.84
	MINIMUM	3610	5.0	56	8.0	3.9	.0	42	.0	.00	.00
	MEAN	10594	7.2	219	20.8	6.6	.8	72	12	.41	.35
	K	73	68.0	65	68.0	66.0	63	57	57	62	54

Table 15.--Maximum, minimum, and mean values for chemical, biological, and physical parameters for all sampling locations from November 1968 to December 1980--Continued

NITROGEN, NITRITE TOTAL (MG/L AS N)	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS P)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	FLUORIDE, DISSOLVED (MG/L AS F)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML)	TURBIDITY (JTU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
.060	.270	.300	.160	.6	5200	15	930	12	1200	.5	43
.000	.020	.020	.000	.0	24	1	210	0	300	.0	10
.026	.098	.103	.054	.3	804	3	615	5	773	.1	29
58.000	60.000	59.000	59.000	62	35	48	15	15	8	9.0	8
.030	.220	.250	.190	.4	1400	8	750	16	790	.5	40
.010	.020	.020	.000	.0	50	1	280	4	420	.0	10
.013	.057	.066	.040	.1	322	3	488	8	564	.2	21
33.000	33.000	33.000	33.000	36	10	17	8	7	7	7.0	7
.180	6.000	6.200	15.000	5.0	24000	190	780	10	1200	.5	70
.010	.015	.300	.010	.2	25	3	10	0	130	.0	10
.047	1.366	1.478	1.689	1.4	2272	16	221	3	478	.1	25
64.000	65.000	65.000	64.000	71	35	49	19	17	11	11	11
.110	.740	.890	4.800	.4	1300	5	1200	12	1200	.5	30
.010	.050	.050	.020	.0	1300	1	210	0	440	.1	10
.028	.136	.151	.292	.1	1300	2	732	3	771	.3	17
19.000	18.000	19.000	19.000	28	1	12	18	17	7	7.0	7
.020	.260	.330	.100	.4	--	7	1000	16	1200	.5	30
.010	.050	.050	.010	.0	--	1	60	0	100	.1	10
.016	.114	.141	.038	.2	--	2	626	5	567	.3	20
20.000	20.000	20.000	20.000	29	--	13	18	16	7	7.0	7
.030	.370	.380	.230	.6	3900	110	810	17	950	.7	300
.000	.050	.050	.000	.0	100	1	230	0	360	.0	10
.015	.143	.153	.055	.2	1402	11	464	4	568	.1	42
55.000	56.000	54.000	48.000	58	9	36	21	18	14	17	15
1.900	42.000	42.000	23.000	29	166000	62	440	20	1000	.5	120
.000	1.300	1.500	.010	2.0	100	3	10	0	190	.0	40
.152	17.394	18.327	5.636	6.7	7303	15	160	4	571	.1	69
77.000	74.000	77.000	71.000	80	39	60	24	22	15	18	15
.020	.410	.410	.050	.5	--	--	1400	1	1500	.5	40
.010	.130	.140	.000	.1	--	--	1400	1	1500	.5	40
.016	.265	.282	.017	.2	--	--	1400	1	1500	.5	40
11.000	11.000	11.000	11.000	11	--	--	1	1	1	1.0	1
.030	.450	.580	.040	.3	--	--	1100	1	1100	.5	80
.010	.080	.090	.000	.2	--	--	1100	1	1100	.5	80
.016	.230	.268	.017	.2	--	--	1100	1	1100	.5	80
9.000	9.000	9.000	9.000	9.0	--	--	1	1	1	1.0	1
.110	6.900	6.900	1.400	2.0	9200	95	810	6	940	.5	30
.010	.120	.120	.010	.0	28	1	110	0	170	.0	10
.022	1.027	1.204	.192	.5	827	9	407	1	542	.1	20
66.000	67.000	59.000	59.000	70	43	52	15	13	11	12	11
.050	.780	1.100	.440	1.9	69000	49	770	20	1500	.5	50
.008	.049	.060	.010	.0	0	1	30	0	120	.0	20
.018	.185	.191	.064	.3	3300	11	283	6	888	.1	34
68.000	103	75.000	71.000	84	42	71	23	17	15	17	15
.090	1.000	1.300	.800	.7	3800	20	570	27	1000	1.7	60
.000	.050	.035	.000	.0	25	1	0	0	80	.0	10
.014	.208	.246	.047	.2	478	5	225	5	480	.2	23
82.000	114	115	111	122	38	90	44	34	29	34	31
.030	.430	1.000	.180	.8	40000	50	700	24	780	.5	50
.007	.030	.033	.000	.1	1350	1	80	0	170	.0	10
.013	.194	.264	.041	.2	17717	8	301	4	467	.1	23
27.000	61.000	50.000	45.000	58	3	42	25	21	17	20	18
.030	.330	.450	.090	1.0	4800	29	480	13	810	.5	40
.000	.020	.090	.000	.0	70	1	0	0	100	.0	10
.011	.163	.184	.034	.2	509	6	176	3	446	.2	23
54.000	64.000	57.000	54.000	59	32	50	14	13	10	11	10

Table 16.--Inventory of the number of water-quality samples collected

WATER YEAR	NO. SAMPL	D.S.	HARDNESS	MAJOR CATIONS	SILICA	ALUMINUM	IRON	MANGANESE	MAJOR ANIONS	FLUORIDE	CARBON	NITROGEN	PHOSPHOROUS	D.O.	BOD	COD	PH	PESTICIDES	RADIOCHEMICAL	MICROBIOLOGIC	SEDIMT SUS	SEDIMT BED
02314980 ROCKY CREEK NR BELMONT,FLA. LAT=30 32 40 LONG=082 44 02 STREAM STATE=12 COUNTY=047 DIST.=12																						
1971	6	2	2	2	6	0	3	3	2	5	3	6	6	6	3	0	6	0	0	5	0	0
1972	6	0	0	0	6	0	1	1	0	6	5	6	6	6	6	0	6	0	0	6	0	0
1973	6	0	0	0	6	0	0	0	0	6	6	6	6	6	6	0	6	0	0	6	0	0
1974	5	2	2	2	2	2	2	2	2	5	5	5	5	4	5	0	5	0	0	5	0	0
1975	7	0	0	0	0	2	2	2	0	7	7	7	7	7	7	0	6	0	0	7	0	0
1976	8	6	6	6	6	2	2	2	6	8	6	8	8	8	5	0	8	0	3	4	4	0
1977	7	6	6	5	6	3	3	3	5	7	7	7	7	7	3	0	7	0	3	2	5	0
1978	6	0	0	0	0	1	1	1	0	5	5	6	6	5	6	0	6	0	0	0	0	5
1979	6	2	2	2	2	0	0	0	2	4	4	4	4	4	4	0	4	0	1	0	0	0
1980	7	6	6	6	6	2	2	2	6	7	7	7	7	7	7	0	7	0	2	0	0	0
1981	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0
02315000 SUWANNEE R NR BENTON FLA LAT=30 30 30 LONG=082 41 50 STREAM STATE=12 COUNTY=047 DIST.=12																						
1969	2	2	2	2	2	0	1	0	2	2	0	2	1	0	0	0	2	0	0	0	0	0
1970	2	2	2	2	2	0	0	0	2	2	0	2	1	2	0	0	2	0	0	0	0	0
1975	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	0	2	0	0	1	1	0
1976	5	0	0	0	0	0	0	0	0	4	5	5	5	5	5	0	5	0	0	5	0	0
1977	6	2	2	2	2	2	2	2	2	6	5	6	6	4	6	0	6	0	0	4	0	0
1978	8	2	2	2	2	1	1	1	2	8	6	6	6	7	6	0	8	0	0	0	0	0
1979	6	0	0	0	0	1	1	1	0	5	6	6	6	6	6	0	6	0	0	0	0	0
1980	7	0	0	0	0	2	2	2	0	6	7	7	7	7	7	0	7	0	0	0	0	0
1981	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0
02315005 HUNTER CREEK NEAR BELMONT FLA LAT=30 29 20 LONG=082 41 40 STREAM STATE=12 COUNTY=047 DIST.=12																						
1969	2	2	2	2	2	0	1	0	2	2	0	2	1	0	0	0	2	0	0	0	0	0
1970	2	2	2	2	2	1	1	1	2	2	1	2	1	1	1	0	2	0	0	0	0	0
1971	1	0	0	0	1	0	0	0	0	1	0	1	1	1	1	0	1	0	0	1	0	0
1972	6	0	0	0	6	0	1	1	0	6	5	6	6	6	6	0	6	0	0	6	0	0
1973	7	0	0	0	6	0	1	1	0	6	6	6	6	6	6	0	6	0	0	6	0	0
1974	6	2	2	2	2	2	2	2	2	6	6	6	6	5	5	0	5	0	0	6	0	0
1975	7	1	1	1	0	2	3	2	1	7	7	7	7	7	7	0	7	0	0	7	0	0
1976	9	7	7	7	7	3	3	3	7	9	9	9	9	9	5	0	9	0	4	5	3	0
1977	10	7	7	7	7	4	4	4	7	10	10	10	10	7	5	0	10	0	4	4	7	0
1978	8	2	2	2	2	1	1	1	2	6	5	6	6	6	6	0	8	0	0	0	0	0
1979	6	5	6	6	6	1	1	1	5	6	6	6	6	6	6	0	6	0	1	0	0	0
1980	7	7	7	7	7	2	2	2	7	7	7	7	7	6	7	0	7	0	2	0	0	0
1981	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0
02315200 DEEP CREEK NR SUWANNEE VALLEY FL LAT=30 21 55 LONG=082 37 13 STREAM STATE=12 COUNTY=023 DIST.=12																						
1976	7	6	6	6	6	3	3	3	6	6	6	6	6	6	0	0	6	0	3	1	5	0
1977	9	9	9	9	9	3	3	3	9	9	6	6	6	6	0	0	9	0	3	0	6	0
1978	6	6	6	6	6	5	5	5	6	6	0	0	0	6	0	0	6	0	4	0	0	0
1979	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	3	0	3	0	0	0
1980	3	3	3	3	3	3	3	3	3	3	3	3	3	1	2	0	3	0	3	0	0	0
1981	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	0	1	0	1	0	0	0
02315392 ROBINSON CR NR SUWANNEE VALLEY FL LAT=30 18 50 LONG=082 38 41 STREAM STATE=12 COUNTY=023 DIST.=12																						
1976	7	7	7	7	7	3	3	3	7	7	7	7	7	6	0	0	7	0	3	0	5	0
1977	9	9	9	9	9	3	3	3	9	9	6	6	6	6	1	0	9	0	3	0	6	0
1978	6	6	6	6	6	5	5	5	6	6	0	0	0	5	0	0	6	0	4	0	0	0
1979	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	3	0	3	0	0	0
1980	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	0	3	0	3	0	0	0
1981	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	0	0
02315500 SUWANNEE RIVER AT WHITE SPRINGS, FLA. LAT=30 19 32 LONG=082 44 18 STREAM STATE=12 COUNTY=023 DIST.=12																						
1969	6	3	3	3	3	0	2	0	3	4	0	4	4	2	1	0	4	0	0	1	0	0
1970	8	2	3	3	4	1	1	1	2	7	2	7	6	7	6	0	7	1	0	6	0	0
1971	6	2	2	2	6	0	2	2	2	6	2	6	6	6	4	0	6	0	0	4	0	0
1972	3	2	2	2	2	0	2	2	2	2	2	2	2	1	2	0	2	0	0	0	0	0
1973	3	3	3	3	3	2	3	3	2	3	3	3	3	3	2	0	3	0	0	0	0	0
1974	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	0	2	0	0	0	0	0
1975	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0
1976	6	2	2	2	2	2	2	2	2	6	2	6	6	6	2	0	6	0	0	0	0	0
1977	6	2	2	2	2	2	2	2	2	6	2	6	6	3	2	0	6	0	0	0	0	0
1978	8	2	2	2	2	1	1	1	2	8	0	6	6	7	0	0	8	0	0	0	0	0
1979	6	0	0	0	0	1	1	1	0	6	0	6	6	6	1	0	6	0	0	0	0	0
1980	6	0	0	0	0	1	1	1	0	5	0	6	6	6	0	0	6	0	0	0	0	0
1981	2	0	0	0	0	1	1	1	0	2	0	2	2	1	0	0	2	0	0	0	0	0

Table 16.—Inventory of the number of water-quality samples collected--Continued

WATER YEAR	NO. SAMPL	D.S.	HARDNESS	MAJOR CATIONS	SILICA	ALUMINUM	IRON	MANGANESE	MAJOR ANIONS	FLUORIDE	CARBON	NITROGEN	PHOSPHOROUS	D.O.	BOD	COD	PH	PESTICIDES	RADIOCHEMICAL	BIOLOGIC	SEDMT SUS	BED
02315520 SWIFT CREEK AT FACIL FLA LAT=30 22 14 LONG=082 46 00 STREAM STATE=12 COUNTY=047 DIST.=12																						
1969	4	2	2	2	2	0	1	0	2	3	0	3	2	1	1	0	3	0	0	1	0	0
1970	7	2	3	3	3	1	1	1	2	7	2	7	6	7	6	0	7	0	0	3	0	0
1971	6	2	2	2	6	0	2	2	2	6	6	6	6	6	6	0	6	0	0	4	0	0
1972	6	2	2	2	6	0	2	2	2	6	6	6	6	6	6	0	6	0	0	6	0	0
1973	6	2	2	2	6	1	2	2	2	6	6	6	6	6	6	0	6	0	0	6	0	0
1974	6	2	2	2	2	2	2	2	2	6	6	6	6	6	6	0	6	0	0	6	0	0
1975	7	4	4	4	3	3	4	3	4	7	7	7	7	7	7	0	7	0	0	7	0	0
1976	10	7	7	7	7	4	4	4	7	10	10	10	10	10	4	0	10	0	4	5	5	0
1977	9	7	7	7	7	4	4	4	7	9	9	9	9	7	5	0	9	0	3	3	6	0
1978	6	0	0	0	0	1	1	1	0	6	6	6	6	5	6	0	6	0	0	0	0	0
1979	6	6	6	6	6	1	1	1	6	6	6	6	6	6	6	0	6	0	2	0	0	0
1980	6	6	6	6	6	1	1	1	6	6	6	6	6	5	6	0	6	0	1	0	0	0
1981	2	2	2	2	2	1	1	1	2	2	2	2	2	1	2	0	2	0	1	0	0	0
02315532 ROCKY CREEK NR HOUSTON, FL LAT=30 18 56 LONG=082 50 42 STREAM STATE=12 COUNTY=121 DIST.=12																						
1979	6	4	4	4	4	0	0	0	4	4	3	4	4	4	4	0	4	0	1	0	0	0
1980	7	5	5	5	5	1	1	1	5	6	6	6	6	6	5	0	6	0	1	0	0	0
1981	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0
02315542 CAMP BRANCH NR GENOA, FL LAT=30 24 25 LONG=082 51 54 STREAM STATE=12 COUNTY=047 DIST.=12																						
1979	6	4	4	4	4	0	0	0	4	4	2	4	4	4	4	0	4	0	1	0	0	0
1980	6	4	4	4	4	1	1	1	4	4	4	4	4	4	4	0	4	0	0	0	0	0
1981	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0
02315550 SUWANNEE RIVER AT SUWANNEE SPRINGS FLA LAT=30 23 34 LONG=082 56 00 STREAM STATE=12 COUNTY=121 DIST.=12																						
1969	4	3	3	3	3	0	2	0	3	4	0	4	3	1	1	0	4	0	0	1	0	0
1970	7	2	3	3	3	0	0	0	2	7	1	7	6	7	6	0	7	0	0	5	0	0
1971	6	2	2	2	6	0	3	3	2	6	5	6	6	6	6	0	6	0	0	6	0	0
1972	6	0	0	0	6	0	1	1	0	6	5	6	6	6	5	0	6	0	0	6	0	0
1973	8	0	0	0	6	0	1	1	0	6	6	6	6	6	6	0	7	0	0	6	0	0
1974	6	2	2	2	2	2	2	2	2	6	6	6	6	6	6	0	6	0	0	5	0	0
1975	6	0	0	0	0	1	1	1	0	5	6	6	6	6	6	0	5	0	0	6	0	0
1976	6	0	0	0	0	1	1	1	0	5	6	6	6	6	6	0	6	0	0	6	0	0
1977	6	0	0	0	0	1	1	1	0	6	6	6	6	3	6	0	6	0	0	4	0	0
1978	6	0	0	0	0	1	1	1	0	6	6	6	6	5	6	0	6	0	0	0	0	0
1979	6	0	0	0	0	1	1	1	0	6	6	6	6	6	6	0	6	0	0	0	0	0
1980	7	0	0	0	0	2	2	2	0	6	7	7	7	7	7	0	7	0	0	0	0	0
1981	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0
02319000 WITHLACOOCHEE RIVER NEAR PINETTA, FLA. LAT=30 35 43 LONG=083 15 35 STREAM STATE=12 COUNTY=079 DIST.=12																						
1969	19	7	7	7	7	0	5	0	7	8	0	19	14	2	1	0	8	0	0	1	0	0
1970	20	6	7	7	7	1	1	1	6	11	2	20	17	6	6	0	11	0	0	6	0	0
1971	12	7	7	7	12	0	2	2	7	11	3	12	11	7	4	0	11	0	0	4	0	0
1972	13	4	4	4	13	0	2	2	4	9	5	13	13	7	6	0	8	0	0	7	0	0
1973	12	2	2	2	11	1	2	2	2	5	5	11	11	6	5	0	6	0	0	5	0	0
1974	7	2	2	2	3	2	2	2	2	6	6	7	7	6	6	0	6	0	0	5	0	0
1975	7	3	3	3	3	3	3	3	3	6	7	7	7	7	7	0	7	0	0	7	0	0
1976	5	1	1	1	1	1	1	1	1	3	5	5	5	5	5	0	5	0	0	5	0	0
1977	6	2	2	2	2	2	2	2	2	6	5	6	6	3	6	0	6	0	0	4	0	0
1978	6	0	0	0	0	1	1	1	0	6	6	6	6	5	5	0	6	0	0	0	0	0
1979	6	0	0	0	0	1	1	1	0	6	6	6	6	6	6	0	6	0	0	0	0	0
1980	7	0	0	0	0	2	2	2	0	6	7	7	7	7	7	0	7	0	0	0	0	0
1981	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0

Table 16.--Inventory of the number of water-quality samples collected--Continued

02320500 SUWANNEE RIVER AT BRANFORD, FLA. LAT=29 57 20 LONG=082 55 40 STREAM STATE=12 COUNTY=121 DIST.=12

WATER YEAR	NO. SAMPL	D.S.	HARD-NESS	MAJ-OR CAT-IONS	SIL-ICA	ALU-MI-NUM	IRON	MAN-GA-NESE	MAJ_OR AN-IONS	FLU-O-RIDE	CAR-BON	NI_TRO-GEN	PHOS_PHO-ROUS	D.O.	BOD	COD	PH	PES-TI-CIDES	RAD_IO-CHEM-ICAL	BIO-LOG-IC	SEDMT SUS	SEDMT BED
1969	19	8	8	8	8	0	7	0	8	8	0	19	14	2	2	0	8	0	0	2	0	0
1970	18	6	6	6	6	1	4	1	6	6	1	17	12	5	4	0	7	0	0	4	0	0
1971	13	7	7	7	12	0	2	2	7	11	3	13	11	6	4	0	10	0	0	3	0	0
1972	11	4	4	4	11	0	2	2	4	8	6	11	11	5	6	0	8	0	0	6	0	0
1973	13	2	2	2	12	1	2	2	2	6	6	12	12	6	6	0	6	0	0	6	0	0
1974	12	7	7	7	7	1	3	3	7	9	7	11	11	10	5	0	10	0	0	9	7	0
1975	13	12	12	12	12	0	4	4	12	12	12	12	12	11	10	0	11	0	0	12	10	0
1976	12	12	12	12	12	0	4	4	12	12	11	12	12	12	9	0	12	0	0	6	10	0
1977	11	11	11	11	11	0	3	4	11	11	9	11	11	7	8	0	11	0	0	9	11	0
1978	11	10	10	10	10	0	4	4	10	11	10	11	11	11	6	0	11	0	0	9	10	0
1979	13	11	11	11	11	1	5	5	11	12	13	13	13	11	4	0	13	0	0	11	11	0
1980	13	13	13	13	13	1	4	4	13	13	13	13	13	12	4	0	13	0	0	11	12	0
1981	3	3	3	3	3	0	1	1	3	3	3	3	3	3	0	0	3	0	0	3	3	0

02321500 SANTA FE RIVER AT WORTHINGTON SPRINGS, FL LAT=29 55 16 LONG=082 25 35 STREAM STATE=12 COUNTY=001 DIST.=12

WATER YEAR	NO. SAMPL	D.S.	HARD-NESS	MAJ-OR CAT-IONS	SIL-ICA	ALU-MI-NUM	IRON	MAN-GA-NESE	MAJ_OR AN-IONS	FLU-O-RIDE	CAR-BON	NI_TRO-GEN	PHOS_PHO-ROUS	D.O.	BOD	COD	PH	PES-TI-CIDES	RAD_IO-CHEM-ICAL	BIO-LOG-IC	SEDMT SUS	SEDMT BED
1969	20	7	7	7	7	0	5	0	7	8	0	20	14	1	1	0	8	0	0	1	0	0
1970	25	7	8	8	7	1	1	1	7	11	1	20	16	9	5	0	12	0	0	3	0	0
1971	10	7	7	7	8	1	2	2	7	7	1	8	8	5	2	0	8	0	0	0	0	0
1972	12	4	4	4	8	0	2	2	4	4	1	9	8	2	2	0	4	0	0	0	0	0
1973	16	3	3	3	8	2	3	3	2	3	3	8	8	6	3	0	6	0	0	0	0	0
1974	6	2	2	2	3	2	2	2	2	2	2	6	6	2	2	0	2	0	0	0	0	0
1975	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0
1976	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2	0	0	0	0	0
1977	3	2	2	3	2	1	1	2	3	2	2	3	3	2	2	0	3	0	0	0	0	0
1979	5	5	5	5	5	0	2	2	5	5	5	5	5	5	0	0	5	0	0	5	5	0
1980	13	12	12	12	12	0	4	4	12	12	12	12	12	12	0	0	13	0	0	12	13	0
1981	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	1	0	0	1	1	0

02323500 SUWANNEE RIVER NEAR WILCOX, FLA. LAT=29 35 22 LONG=082 56 12 STREAM STATE=12 COUNTY=075 DIST.=12

WATER YEAR	NO. SAMPL	D.S.	HARD-NESS	MAJ-OR CAT-IONS	SIL-ICA	ALU-MI-NUM	IRON	MAN-GA-NESE	MAJ_OR AN-IONS	FLU-O-RIDE	CAR-BON	NI_TRO-GEN	PHOS_PHO-ROUS	D.O.	BOD	COD	PH	PES-TI-CIDES	RAD_IO-CHEM-ICAL	BIO-LOG-IC	SEDMT SUS	SEDMT BED
1969	3	1	1	1	1	0	1	0	1	2	0	2	2	2	1	0	2	2	0	1	0	0
1970	7	1	2	2	2	1	1	1	1	6	1	6	6	6	6	0	6	3	0	6	0	0
1971	8	2	2	2	6	0	3	3	2	6	3	6	6	6	5	0	6	4	0	4	0	0
1972	7	0	0	0	6	0	1	1	0	6	6	6	6	6	6	0	6	4	0	6	0	0
1973	7	0	0	0	6	0	1	1	0	6	6	6	6	6	6	0	6	0	0	6	0	0
1974	5	2	1	2	1	2	2	2	1	4	4	4	4	5	4	0	4	0	0	4	0	0
1975	6	0	0	0	0	1	1	1	0	6	6	6	6	6	6	0	6	0	0	6	0	0
1976	6	0	0	0	0	1	1	1	0	3	6	6	6	6	5	0	6	0	0	0	0	0
1977	6	0	0	0	0	0	0	0	0	4	6	6	6	4	6	0	6	0	0	0	0	0
1978	6	0	0	0	0	1	1	1	0	5	6	6	6	5	5	0	6	6	0	0	0	0
1979	6	0	0	0	0	1	1	1	0	5	5	6	6	6	5	0	6	0	0	0	0	0
1980	6	0	0	0	0	1	1	1	0	4	6	6	6	6	6	0	6	0	0	0	0	0
1981	2	0	0	0	0	1	1	1	0	2	2	2	2	2	2	0	2	0	0	0	0	0

Table 17.--State of Florida, Department of Environmental Regulation recommended constituent limits for Class III waters[1]

Constituent	Limit, in mg/L, unless otherwise noted	Remarks
Cadmium	0.008	Predominantly freshwater
Chromium	0.05	After reasonable mixing in the receiving water
Coliform, total fecal, membrane filtered (colonies/100 mL)	2400	At any time
Copper	0.03	Predominantly freshwater
Dissolved oxygen	5.0	Freshwater aquatic life; lower limit
Fluoride	10.0	Surface waters: general criteria
Iron	1.0	Predominantly freshwater
Lead	0.03	Predominantly freshwater
Mercury	0.002	Predominantly freshwater
Nitrogen, ammonia	0.02	Un-ionized, freshwater aquatic life
pH, units	6.08.5	Predominantly freshwater
Specific conductance (micromhos/cm) at 25°C	500	Freshwater
Zinc	0.03	Predominantly freshwater

[1] In 1979, the Suwannee River was designated as an Outstanding Florida Water. Recommended constituent limits for Outstanding Florida Waters are based on the ambient water-quality conditions. Because all of these ambient conditions have not yet been determined, Class III waters are used here for comparison purposes only.

Table 18.—General significance of dissolved mineral constituents and properties of water

[Modified from U.S. Geological Survey, 1979]

Constituent or property	Source or cause	General significance
Alkalinity	Caused primarily by bicarbonate, carbonate, and hydroxide. Other weak acid radicals like borate, phosphate, and silicate may contribute to alkalinity.	Ability of water to neutralize strong acid. High alkalinity itself not detrimental but usually associated with high pH, hardness, and dissolved solids which can be detrimental.
Aluminum (Al)	Usually present only in negligible quantities in natural waters except where the waters have been in contact with the more soluble rocks of high aluminum content. Acid waters often contain large amounts.	May be troublesome in feed waters forming scale on boiler tubes. High concentrations usually indicate the presence of acid mine drainage or industrial waste.
Arsenic (As)	Natural arsenic-bearing minerals. Found in some ground waters, in wastes from industry and mining activity, and residues from some insecticides and herbicides.	The U.S. Environmental Protection Agency, (1975) gives a limit of 50 ug/L for potable waters. Lethal dose for animals is believed to be about 20 milligrams per animal pound. Small concentrations in drinking water can accumulate in man and other animals until lethal dosage is reached.
Bicarbonate (HCO_3) and Carbonate (CO_3)	Produced by reaction of atmospheric carbon dioxide with water. Dissolved from carbonate rocks such as limestone and dolomite.	Bicarbonate and carbonate produce alkalinity. Bicarbonates of calcium and magnesium decompose in steam boilers and hot water facilities to precipitate as scale and release corrosive carbon dioxide gas. In combination with calcium and magnesium cause carbonate hardness.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

Constituent or property	Source or cause	General significance
Cadmium (Cd)	Found in wastes from pigment works, textile printing, lead mines, and chemical industries.	The results of animal studies suggest that very small amounts of cadmium can produce nephrotoxic and cardiovascular effects. The reproductive organs of animals are specifically affected after parenteral administration of very small amounts of cadmium salts. The U.S. Environmental Protection Agency (1975) states that cadmium in excess of 10 ug/L is cause for rejection of the water supply. Cadmium is also toxic to fish and aquatic life in varying concentrations.
Calcium (Ca) and Magnesium (Mg)	Dissolved from practically all soils and rocks, but especially from limestone, dolomite, and gypsum. Calcium and magnesium are found in large quantities in some brines. Magnesium is present in large quantities in seawater.	Causes most of the hardness and scale-forming properties of water; consumes soap (see hardness). Waters low in calcium and magnesium are desired in electroplating, tanning, dyeing, and in textile manufacturing.
Chloride (Cl)	Dissolved from rocks and soils. Present in sewage and found in large amounts in ancient brines, seawater, and industrial brines.	About 300 mg/L in combination with sodium gives salty taste to water. Increases the corrosiveness of water. The U.S. Environmental Protection Agency (1977) recommends that the chloride content should not exceed 250 mg/L.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

Constituent or property	Source or cause	General significance
Chromium (Cr)	Few if any waters contain chromium from natural sources. Natural waters probably contain only traces of chromium as a cation unless the pH is very low. When chromium is present in water, it is usually the result of pollution by industrial wastes such as metal pickling, plating, manufacturing of paints, dyes, explosives, ceramics, paper, glass, and photography processing.	The U.S. Environmental Protection Agency (1975) limits the maximum concentration of hexavalent chromium to 50 ug/L. Toxicity to aquatic life varies widely with the species, temperature, pH, and other factors.
Cobalt (Co)	Cobalt occurs in nature in the minerals smaltite $(Co,Ni)As_2$, and cobaltite, (CoAsS). Alluvial deposits soils derived from shales often contain cobalt in the form of phosphate or sulfate, but other soil types may be markedly deficient in cobalt in any form. Biological activity may aid in the solution of small amounts of cobalt. May also be present in industrial wastes especially those from manufacture of ceramics, inks, electric heating units, and cobalt pigments.	Usually suggests pollution. Relatively low toxicity to man. Fish and aquatic life tolerance varies widely and from less than 3 mg/L to more than 10 mg/L. Essential in trace quantities for plant growth.

Table 18.—General significance of dissolved mineral constituents and properties of water—Continued

Constituent or property	Source or cause	General significance
Color	Yellow-to-brown color of some water is usually caused by organic matter extracted from leaves, roots, and other organic substances. Objectionable color in water also results from industrial wastes and sewage.	Water for domestic and some industrial uses should be free from perceptible color. The U.S. Environmental Protection Agency (1977) proposes a limit of 15 PtCo units. Color in water is objectionable in food and beverage processing and many manufacturing processes. Limits light penetration in water, thus preventing growth of some organisms.
Copper (Cu)	Copper is a fairly common trace constituent of natural water. Small amounts may be introduced into water by solution of copper and brass water pipes and other copper-bearing equipment in contact with the water or from copper salts added to control algae in open reservoirs. Copper salts such as the sulfate and chloride are highly soluble in waters with a low pH but in water of normal alkalinity the salts hydrolyze and copper may be precipitated. In the normal pH range of natural water containing carbon dioxide, the copper might be precipitated as carbonate.	Copper imparts a disagreeable metallic taste to water. As little as 1.5 mg/L can usually be detected, and 5 mg/L can render the water unpalatable. Copper is not considered to be a cumulative systemic poison like arsenic, lead, and mercury; most copper ingested is excreted by the body and very little is retained. The pathological effects of copper are controversial, but it is generally believed very unlikely that humans could unknowingly ingest the toxic quantities from palatable drinking water. The U.S. Environmental Protection Agency (1977) recommends that copper should not exceed 1 mg/L in drinking and culinary water. Copper is essential in trace amounts for plant growth but becomes toxic in large amounts.

Table 18.—General significance of dissolved mineral constituents and properties of water—Continued

Constituent or property	Source or cause	General significance
Dissolved Oxygen (DO)	Dissolved in water from air and from oxygen given off in the process of photosynthesis by aquatic plants.	Dissolved oxygen increases the palatability of water. The amount necessary to support fish life varies with species and age, with temperature, and concentration of other constituents in the water. Under average stream conditions, 5 mg/L is usually necessary to maintain a varied fish fauna in good condition. For many industrial uses, zero dissolved oxygen is desirable to inhibit corrosion.
Dissolved solids	Chiefly mineral constituents dissolved from weathering of rocks and soils.	The U.S. Environmental Protection Agency (1977b) recommends that the dissolved solids should not exceed 500 mg/L, however, 1,000 mg/L is permitted under certain circumstances. Waters containing more than 1,000 mg/L of dissolved solids are unsuitable for many purposes. The Geological Survey classifies the degree of salinity of water as follows: Dissolved solids (mg/L): less than 1,000, nonsaline; 1,000 to 3,000, slightly saline; 3,000 to 10,000, moderately saline; 10,000 to 35,000, very saline; more than 35,000, brine.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

Constituent or property	Source or cause	General significance
Fluoride (F)	Dissolved in small to minute quantities from most rocks and soils. Enters many waters from fluoridation of municipal supplies.	Fluoride in drinking water reduces the incidence of tooth decay when the water is consumed during the period of enamel calcification. However, it may cause mottling of the teeth depending on the concentration of fluoride, the age of the child, amount of drinking water consumed, and susceptibility of the individual (Maier, 1950).
Hardness (as $CaCO_3$)	In most waters, nearly all the hardness is due to calcium and magnesium. All of the metallic cations other than the alkali metals also cause hardness.	Consumes soap before a lather will form. Deposits soap curd on bathtubs. Hard water forms scale in boilers, water heaters, and pipes. Hardness equivalent to the bicarbonate and carbonate is called carbonate hardness. Any hardness in excess of this is called non-carbonate hardness. Waters of hardness up to 60 mg/L are considered soft; 60 to 120 mg/L, moderately hard; 120 to 180 mg/L, hard; more than 180 mg/L, very hard.

Table 18.—General significance of dissolved mineral constituents and properties of water—Continued

Constituent or property	Source or cause	General significance
Iron (Fe)	Iron is dissolved from many rocks and soils. On exposure to air, normal basic waters that contain more than 1 mg/L of iron soon become turbid with the insoluble reddish ferric compounds produced by oxidation. Surface waters, therefore, seldom contain as much as 1 mg/L of dissolved iron, although some acid waters carry large quantities of iron in solution.	On exposure to air, iron in ground water oxidizes to reddishbrown sediment. More than about 300 ug/L may stain laundry and utensils reddishbrown. Objectionable for food processing, textile processing, beverages, ice manufacture, brewing and other processes. The U.S. Environmental Protection Agency (1977), for esthetic reasons, recommends a limit of 300 ug/L. Larger quantities cause unpleasant taste and favor growth of iron bacteria.
Lead (Pb)	Lead seldom occurs in most natural waters, but industrial mine and smelter effluents may contain relatively large amounts of lead which contaminates the streams. Also, atmospheric contamination which is produced from several types of engine exhausts has considerably increased the availability of this element for solution in rainfall, resulting in contamination of lead in streams (Hem, 1970).	The U.S. Environmental Protection Agency (1975) states that lead shall not exceed 50 ug/L in drinking and culinary water on carriers subject to Federal quarantine regulations. Maximum safe concentrations for animal watering is reported to be 500 ug/L. Toxicity of lead to fish decreases with increasing water hardness.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

Constituent or property	Source or cause	General significance
Manganese (Mn)	Dissolved from some rocks and soils. Not as common as iron. Large quantities often associated with high iron content and with acid waters.	Same objectionable features as iron. Causes dark brown or black stain. The U.S. Environmental Protection Agency (1977) proposes that manganese should not exceed 0.05 mg/L.
Nickel (Ni)	Chiefly from metal-plating works, manufacturing of ceramic colors, and inks.	Presence of nickel in water may suggest pollution. Federal drinking water standards do not place a limit on nickel. In the Soviet Union the maximum permissible concentration is 1.0 mg/L (Kirkor, 1951).
Ammonia Nitrogen fish (NH_4, as N)	Includes nitrogen in the form of NH_3 and NH_4+. Found in many waters but usually only in trace amounts. Waters from hot springs may contain high concentrations. Found also in waters polluted with sewage and other organic waste.	Usually indicates organic pollution. Toxicity to depends on the pH of the water; 2.5 mg/L ammonia nitrogen can be harmful in the 7.4 to 8.5 pH range (Ellis and others, 1948). Ammonium salts are destructive to concrete made from portland cement.
Organic Nitrogen (N)	Amino acids, proteins, and polypeptides. Derived from living organisms and their life processes and from wastes and sewage.	Sometimes indicates pollution. Increases nutrient content of water through decomposition and composition of other nitrogen forms.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

Constituent or property	Source or cause	General significance
Nitrate Nitrogen (NO_3, as N)	Decaying organic matter, sewage, fertilizers, and nitrates in soil.	Concentrations much greater than the local average may suggest pollution. The U.S. Environmental Protection Agency (1975) established a 10 mg/L maximum contamination level for Nitrate Nitrogen. More than about 10 mg/L of nitrate (N) may cause a type of methemoglobinemia in infants, sometimes fatal. Water of high nitrate content should not be used in baby feeding (Maxcy, 1950). Nitrate has shown to be helpful in reducing intercrystalline cracking of boiler steel. It encourages growth of algae and other organisms which produce undesirable tastes and odors.
Nitrite Nitrogen (NO_2, as N)	Unstable in the presence of oxygen and is present in only small amounts in most waters. Found in sewage and other organic wastes.	Presence of nitrite is usually an indication of recent organic pollution. Undesirable in waters for some dyeing and brewing processes.
Total Kjeldahl Nitrogen (N)	Includes ammonia nitrogen and organic nitrogen.	See organic and ammonia nitrogen.
Total Nitrogen (N)	All forms of nitrogen--inorganic and organic.	See ammonia nitrogen, nitrite, nitrate, and organic.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

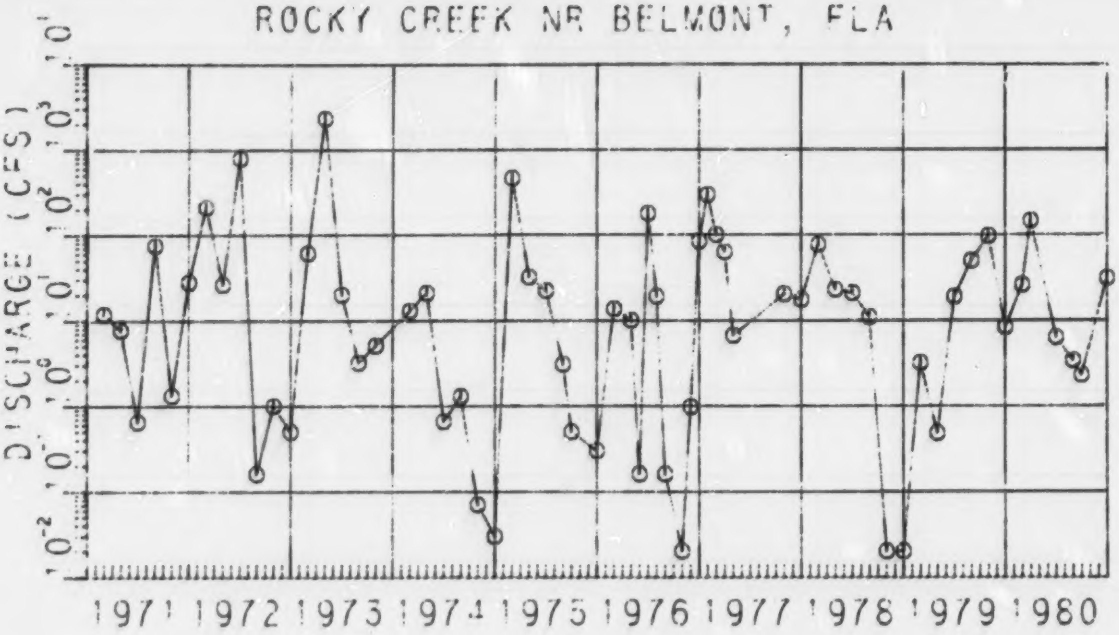
Constituent or property	Source or cause	General significance
Hydrogen ion concentration (pH)	Hydrogen ions derived from ionization of weak and strong acids. Hydrogen on concentration is expressed in terms of pH where pH = log (H+). Acid generating salts and dissolved gases such as SO_2 and CO_2 increase the number of hydrogen ions. Carbonates, bicarbonates, hydroxides, phosphates, silicates, and borates reduce the number of hydrogen ions.	pH ranges between 0 and 14. A pH of 7.0 indicates solution having equal numbers of hydrogen and hydroxide ions. pH higher than 7.0 denotes predominance of hydroxide ions; values lower than 7.0 indicate predominance of hydrogen ions. Corrosiveness of water generally increases with decreasing pH. However, excessively alkaline waters may also attack metals. A pH range of 6.5-8.5 is recommended by the U.S. Environmental Protection Agency (1977).
Strontium (Sr)	Dissolved from rocks and soils. Found in seawater and many brines. Present in waters of local areas where strontium minerals such as celestite and strontianite are present.	Naturally occurring strontium is similar chemically to calcium and only adds to the hardness of water. Radioactive isotopes of strontium, as from nuclear bomb fallout, can be harmful. These isotopes can be detected by radiometric measurements.
Sulfate (SO_4)	Dissolved from rocks and soils containing gypsum, iron sulfides, and other sulfur compounds. Usually present in mine waters and in some industrial waters.	Sulfate in water containing calcium forms hard scale in steam boilers. In large amounts, sulfate in combination with other ions gives bitter taste to water. Some calcium sulfate is considered beneficial in the brewing process. The U.S. Environmental Protection Agency (1977) recommends that the sulfate content should not exceed 250 mg/L.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

Constituent or property	Source or cause	General significance
Temperature	Solar energy, thermal pollution from waste outfalls and heat from Earth's core.	Affects usefulness of water for many purposes. For most uses, a water of uniformly low temperature is desired. Shallow wells show some seasonal fluctuations in water temperature. Ground waters from moderate depths usually are nearly constant in temperature, which is near the mean annual air temperature of the area. In very deep wells, the water temperature generally increases on the average about 1°C with each 100foot increment of depth. Seasonal fluctuations in temperatures of surface waters are comparatively large, depending on the depth of water, but do not reach the extremes of air temperature.
Turbidity	Colloidal suspensions of sediment, precipitates, and other small particles.	The U.S. Environmental Protection Agency, (1975) has established a maximum contaminant level as a monthly average of one nephelometric turbidity unit (NTU) [or 5 turbidity units (NTU) with state approval, provided it does not interfere with disinfection, maintenance of chlorine residual, or bacteriological testing]. Interferes with light penetration and limits growth of organisms. Also directly lethal to some life forms.

Table 18.--General significance of dissolved mineral constituents and properties of water--Continued

Constituent or property	Source or cause	General significance
Zinc (Zn)	Dissolved from some rocks and soils. Found in high concentrations in some mine waters having a low pH. Zinc is used in many commercial products and industrial wastes may contain large amounts. May be derived from zinc plated or galvanized metal products.	Large concentrations may be toxic to aquatic plants and animals. Zinc may have such a toxic action on purifying bacterial flora of streams as to present serious sewage pollution problems. Zinc is an essential and beneficial element in human metablism. The U.S. Environmental Protection Agency (1977) recommends that zinc should not exceed 5,000 ug/L (5 mg/L) in drinking water.



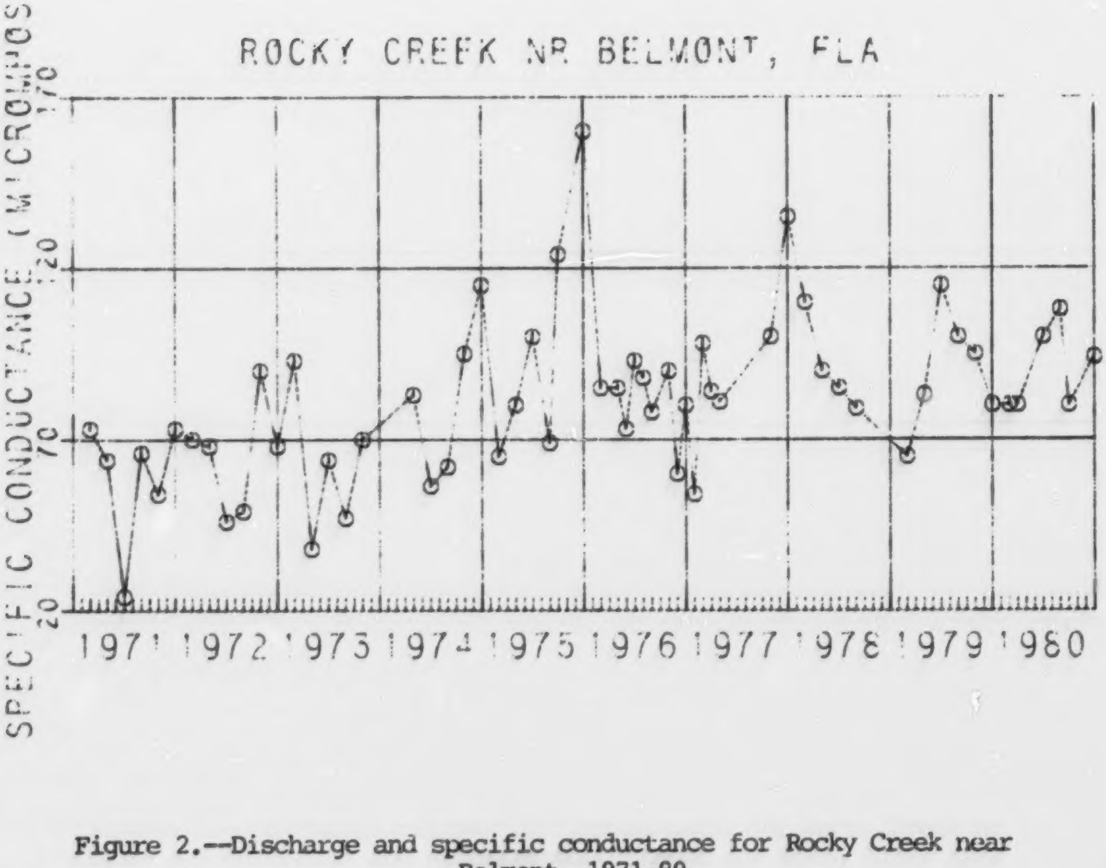
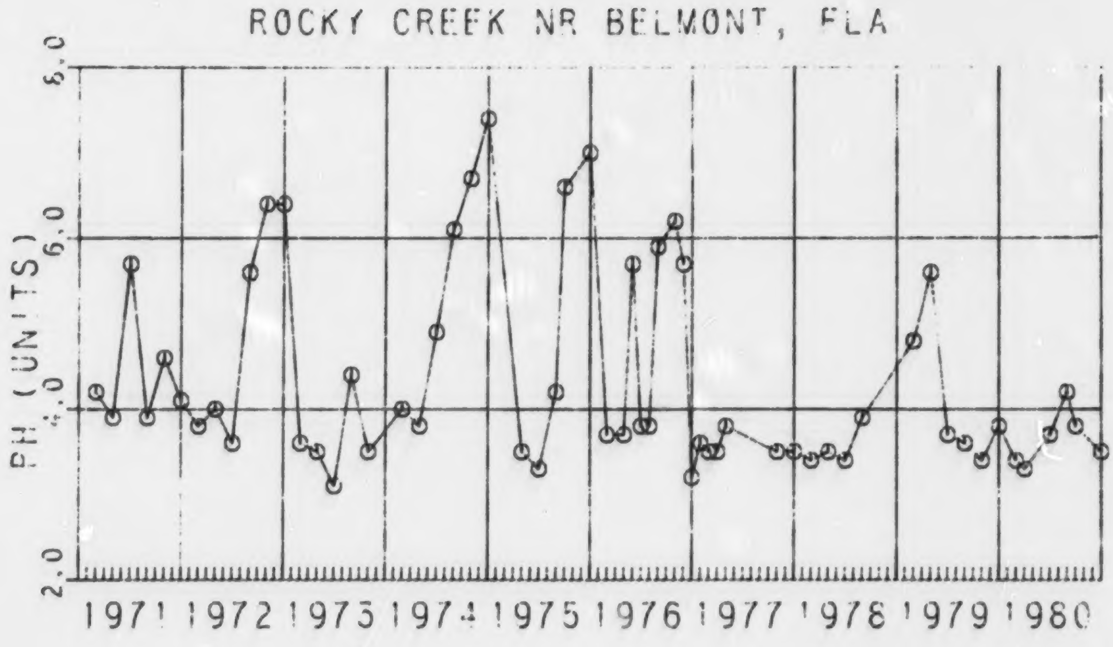


Figure 2.--Discharge and specific conductance for Rocky Creek near Belmont, 1971-80.



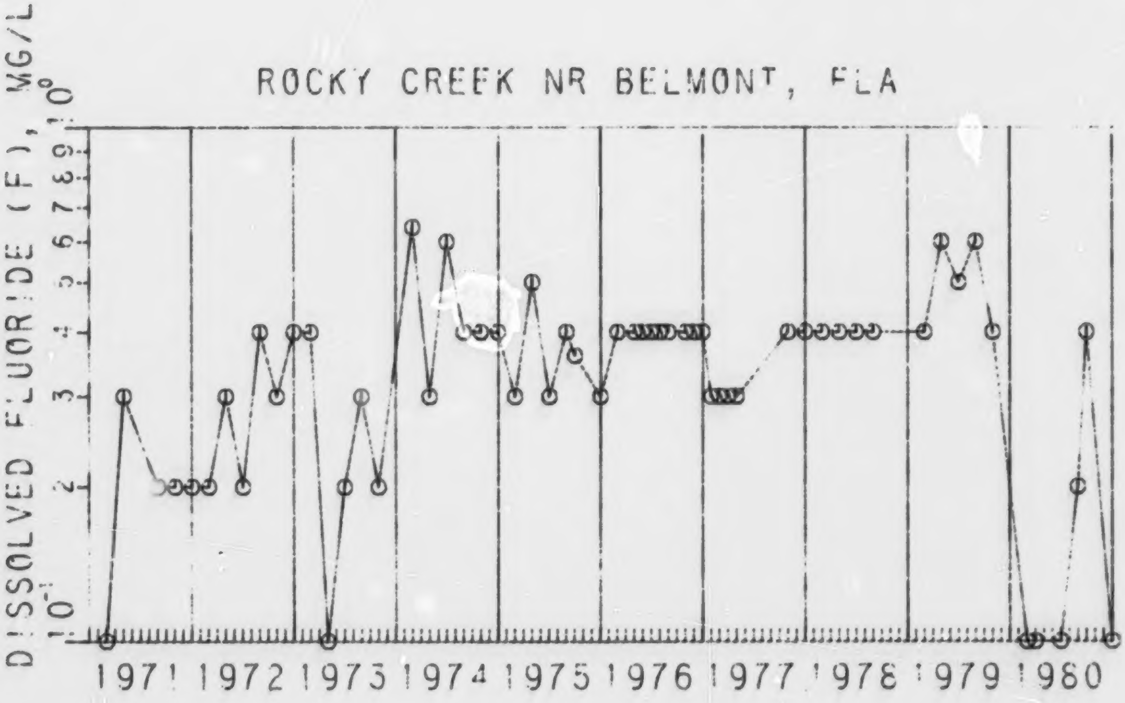


Figure 3.--pH and dissolved fluoride for Rocky Creek near Belmont, 1971-80.

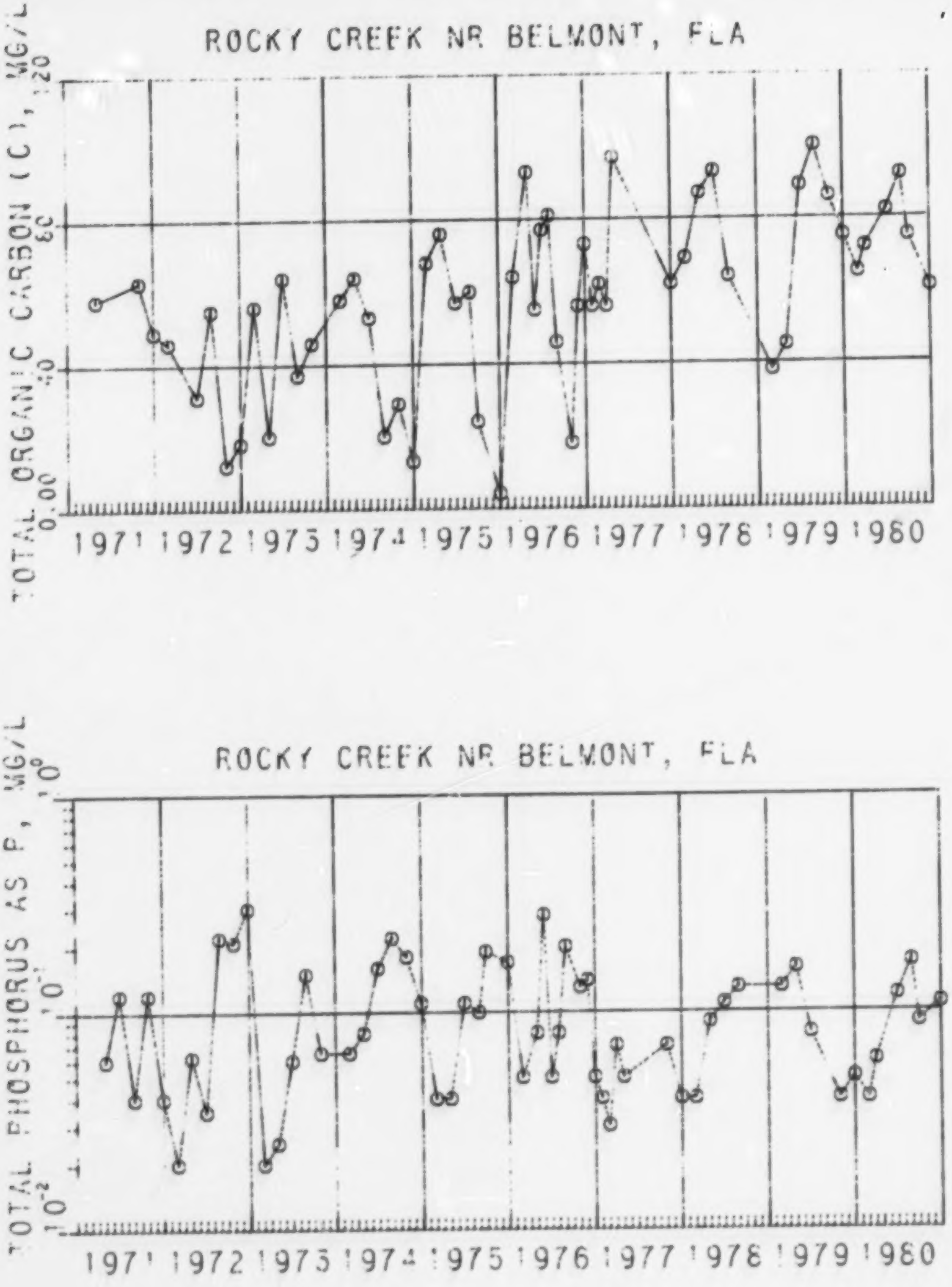
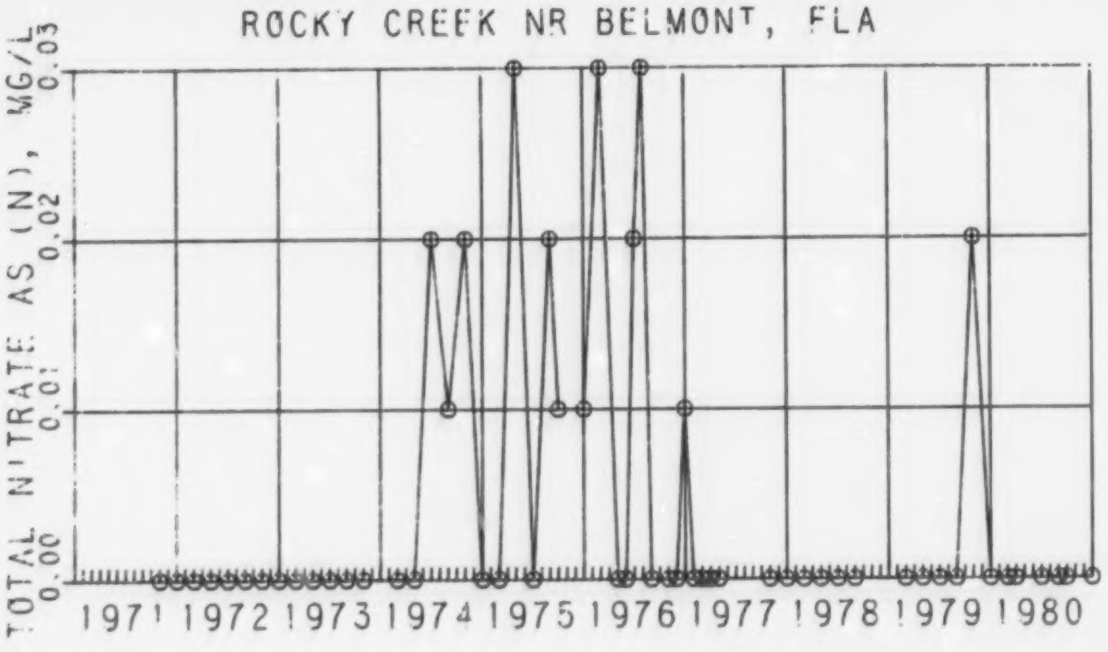


Figure 4.--Total organic carbon and total phosphorus for Rocky Creek near Belmont, 1971-80.



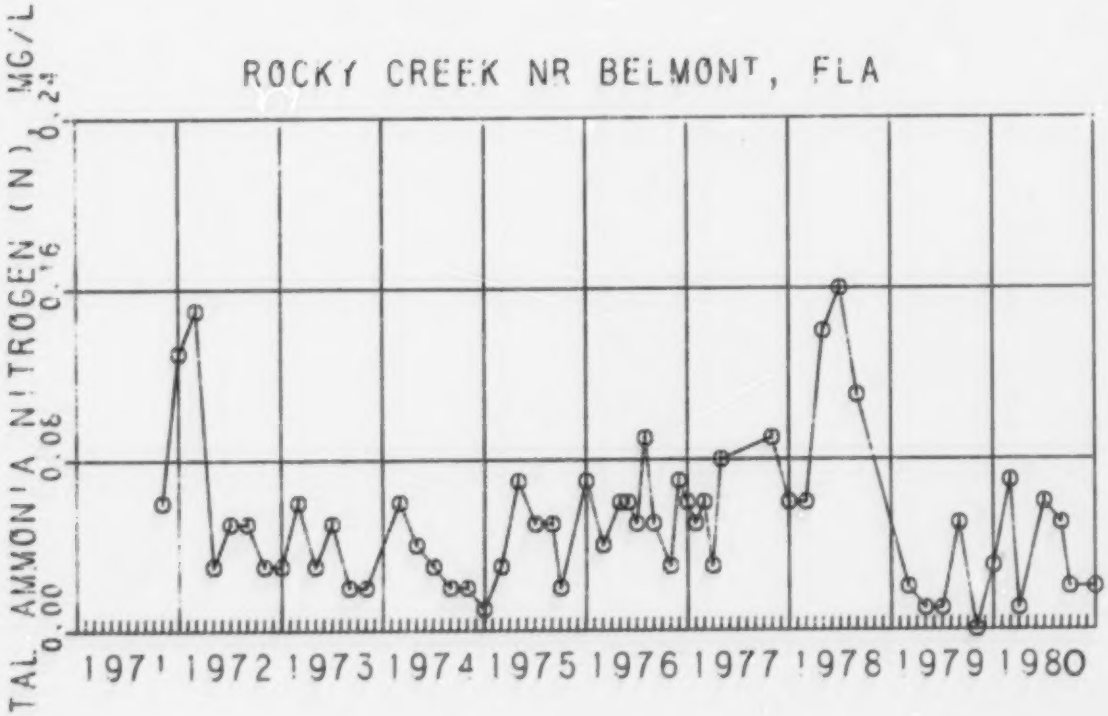


Figure 5.--Total nitrate and total ammonia nitrogen for Rocky Creek near Belmont, 1971-80.

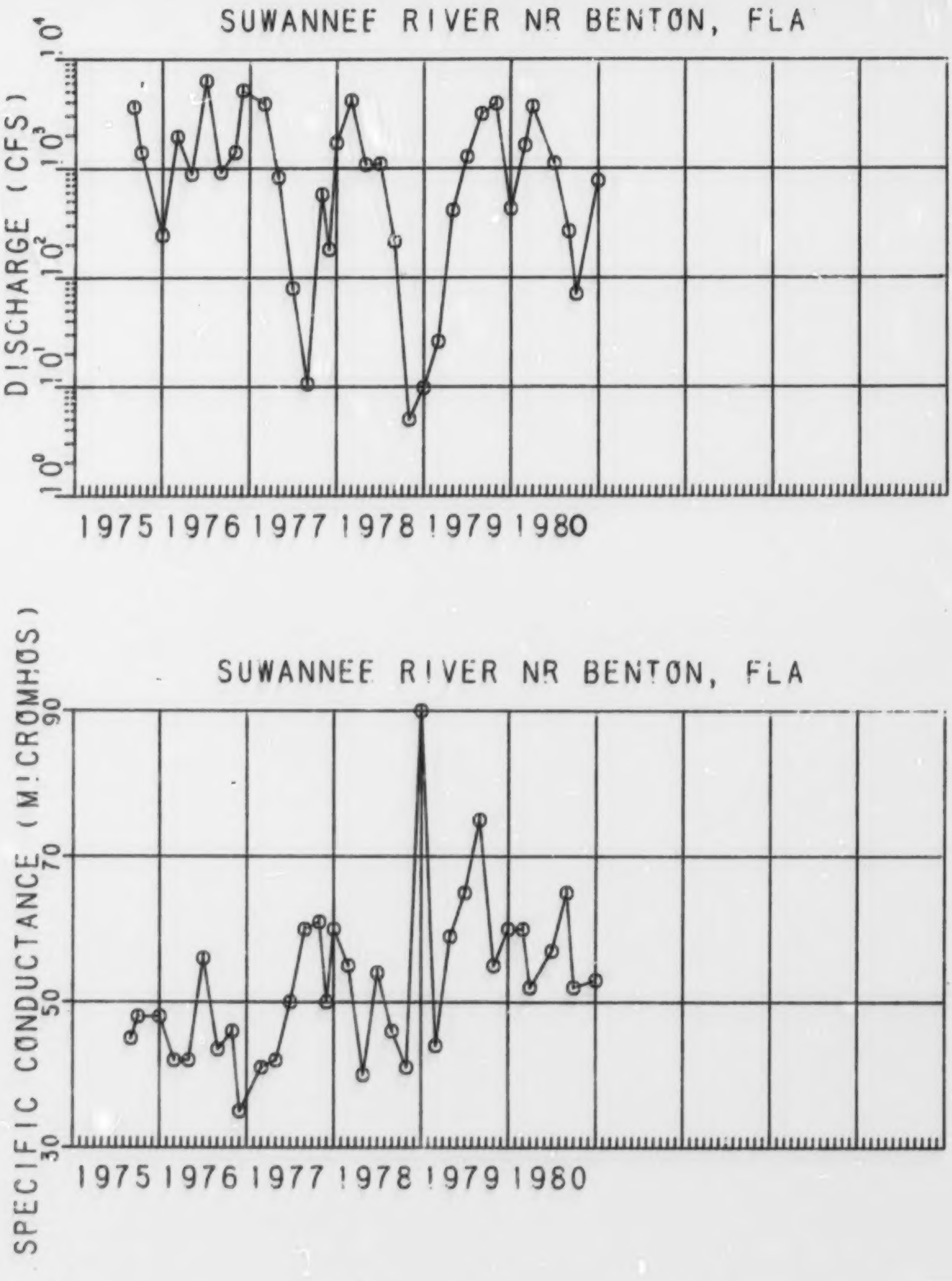


Figure 6.--Discharge and specific conductance for Suwannee River near Benton, 1975-80.

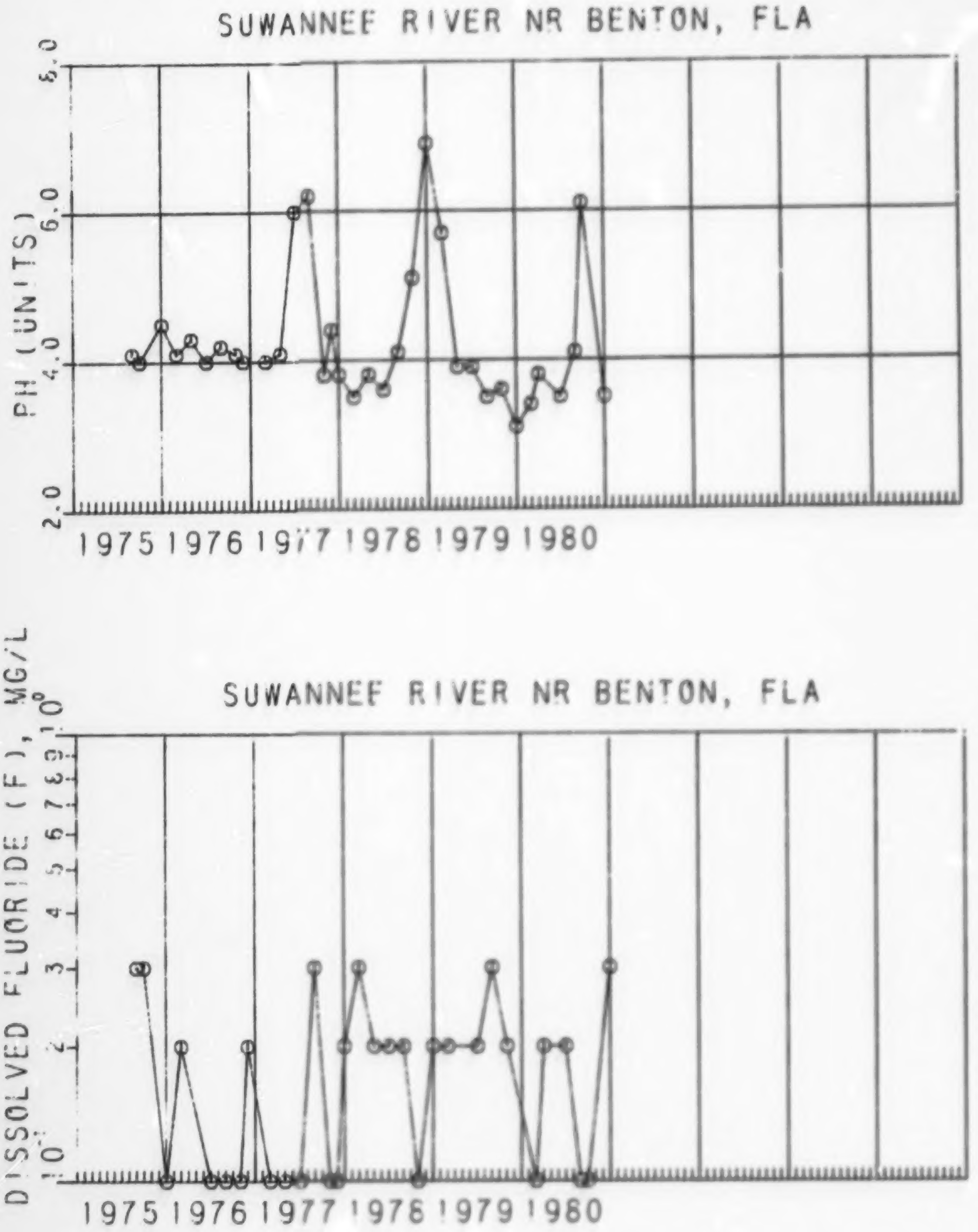
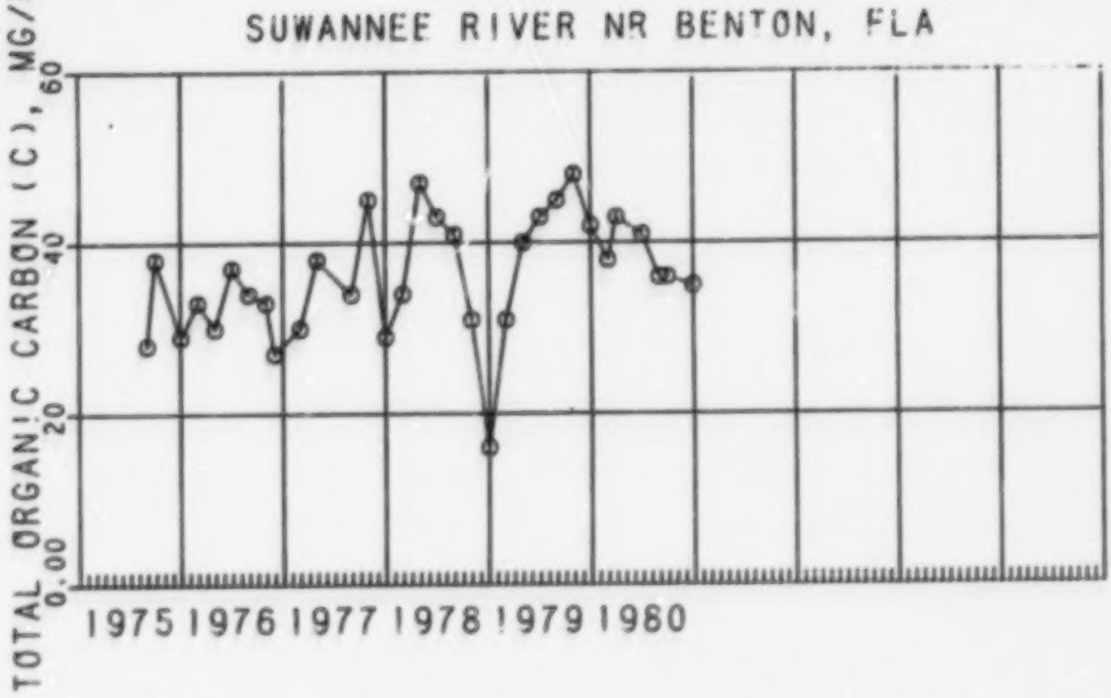


Figure 7.--pH and dissolved fluoride for Suwannee River near Benton, 1975-80.



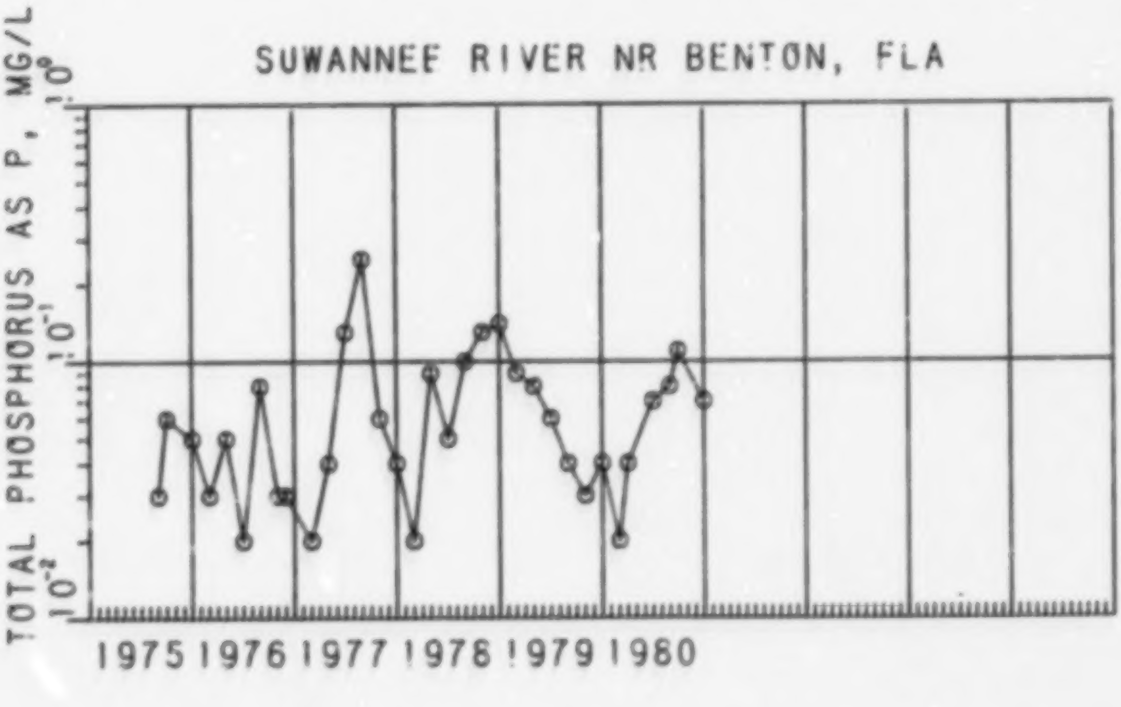


Figure 8.--Total organic carbon and total phosphorus for Suwannee River near Benton, 1975-80.

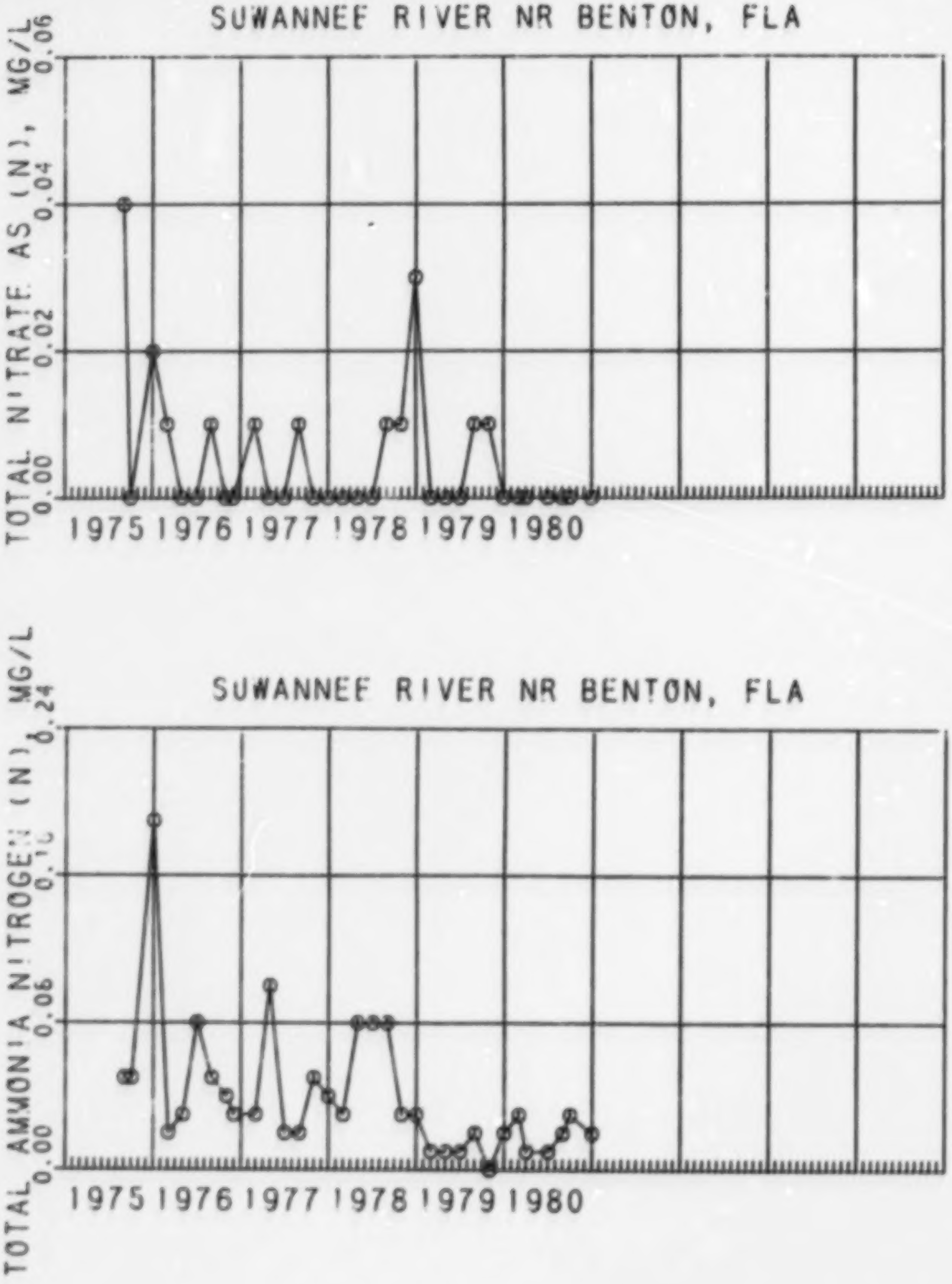


Figure 9.--Total nitrate and total ammonia nitrogen for Suwannee River near Benton, 1975-80.

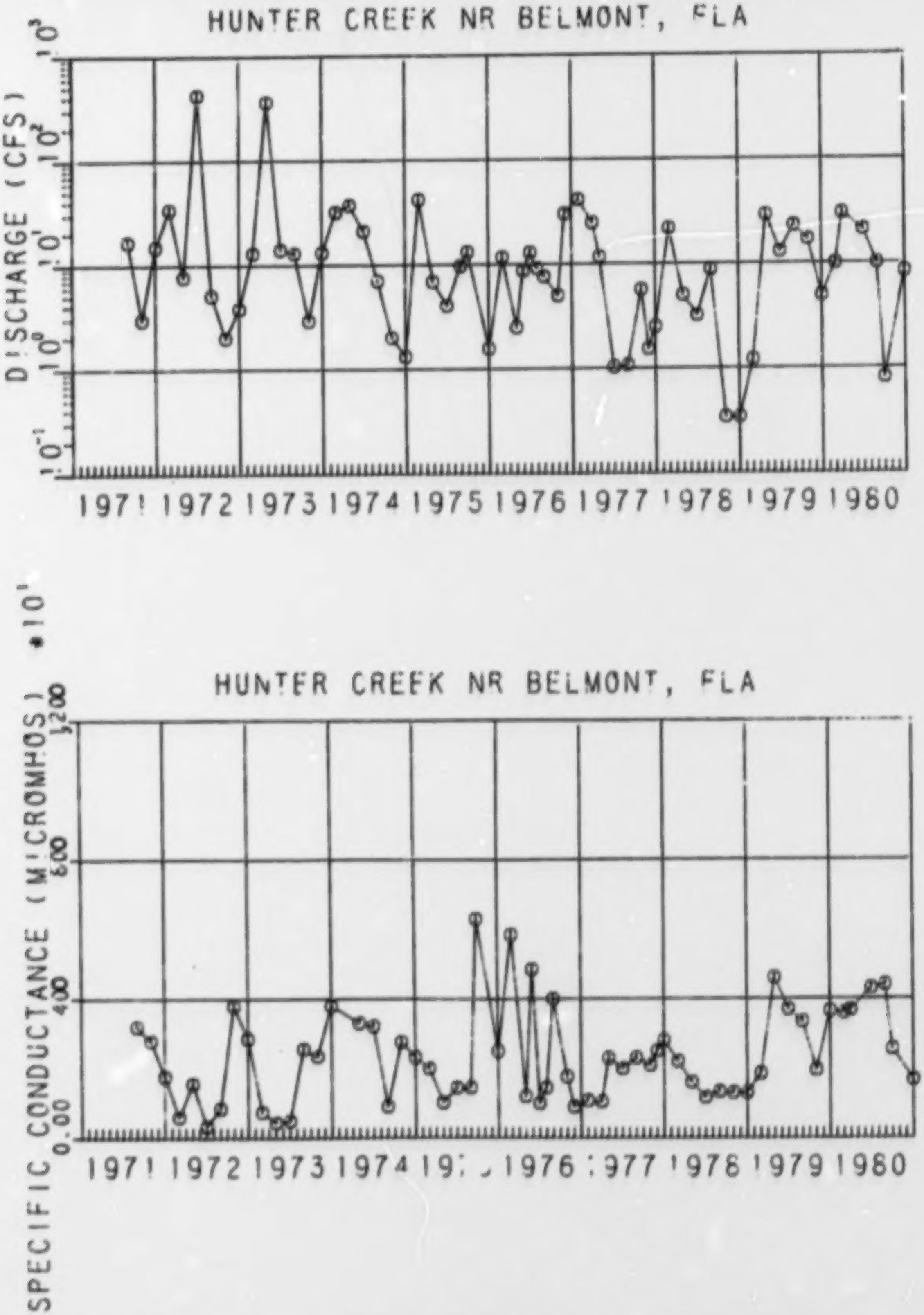
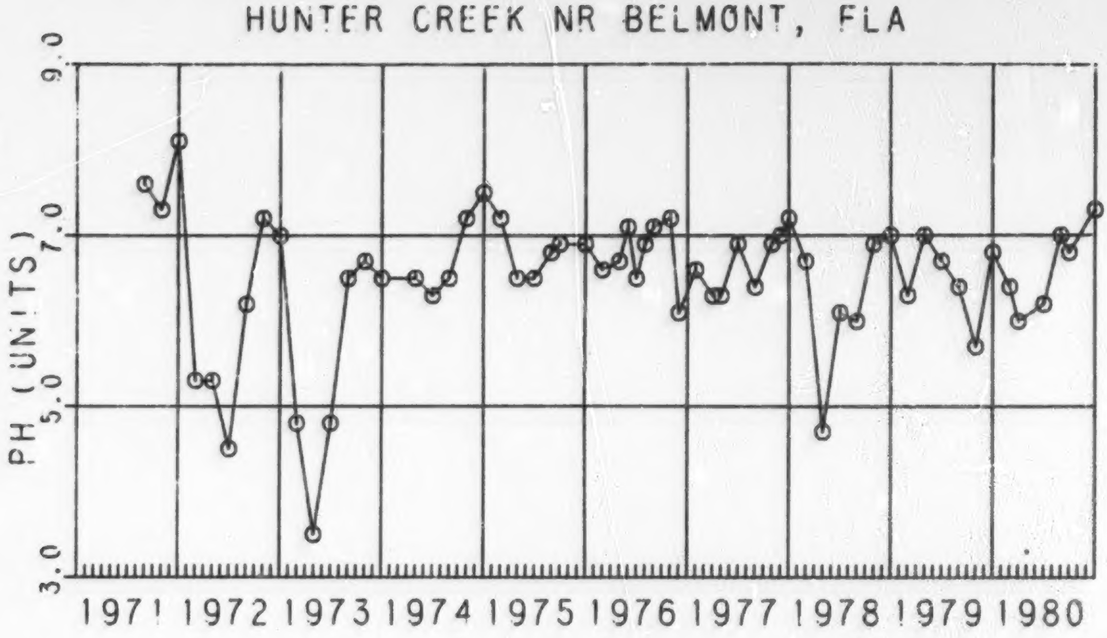


Figure 10.—Discharge and specific conductance for Hunter Creek near Belmont, 1971-80.



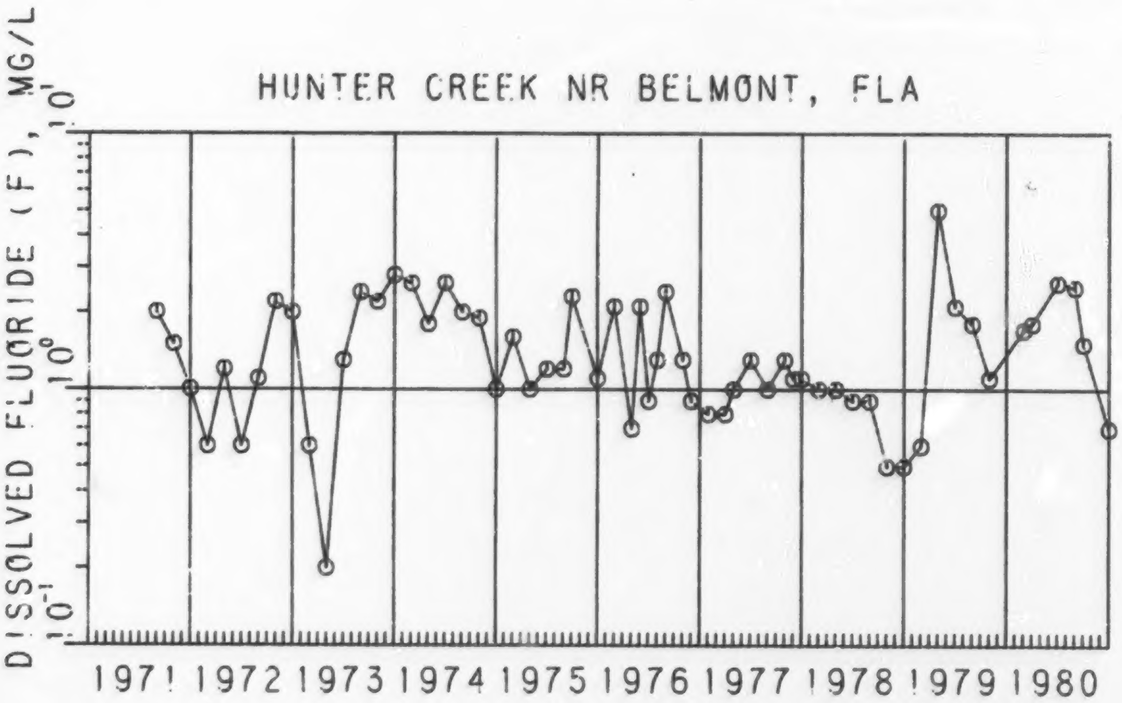
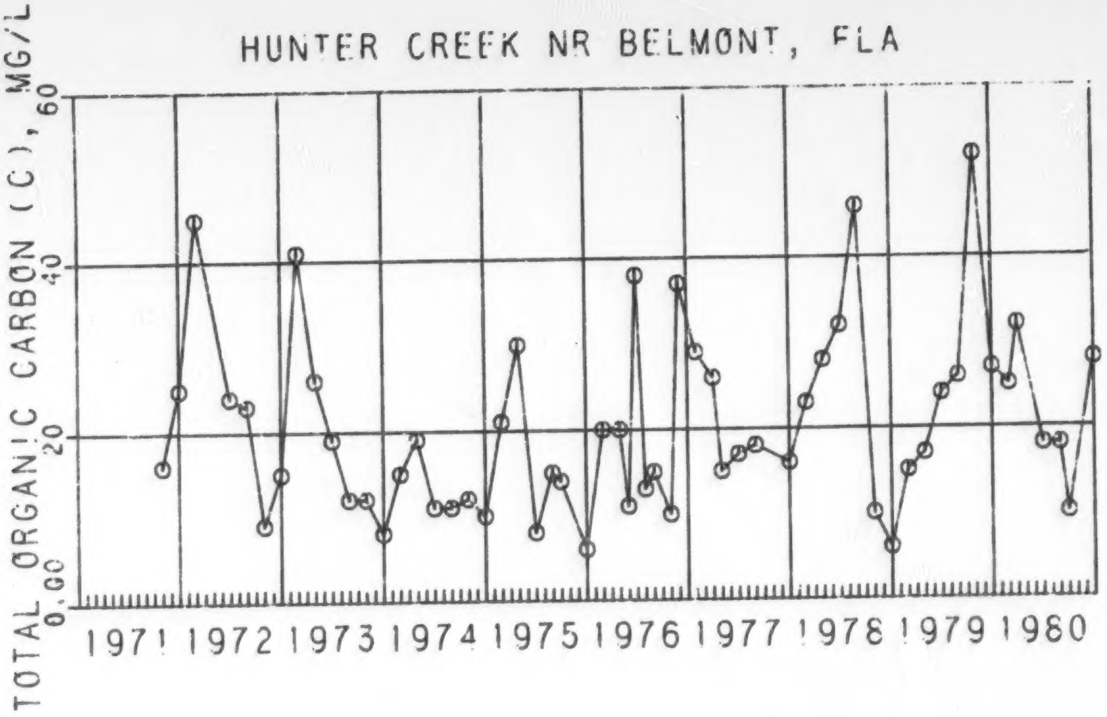


Figure 11.--pH and dissolved fluoride for Hunter Creek near Belmont, 1971-80.



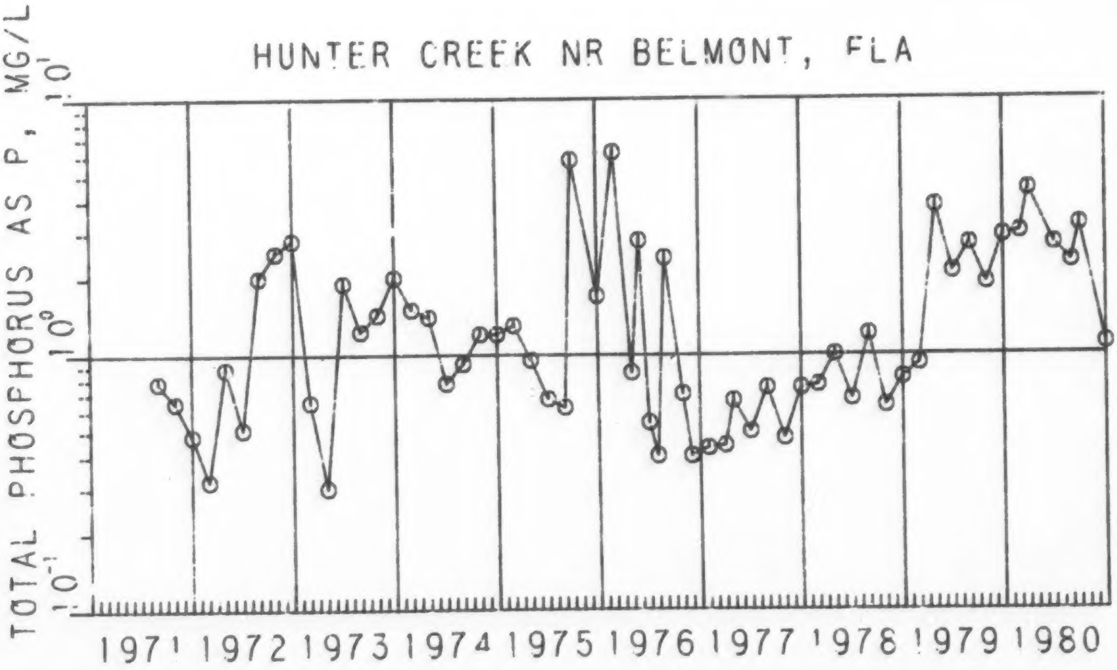


Figure 12.--Total organic carbon and total phosphorus for Hunter Creek near Belmont, 1971-80.

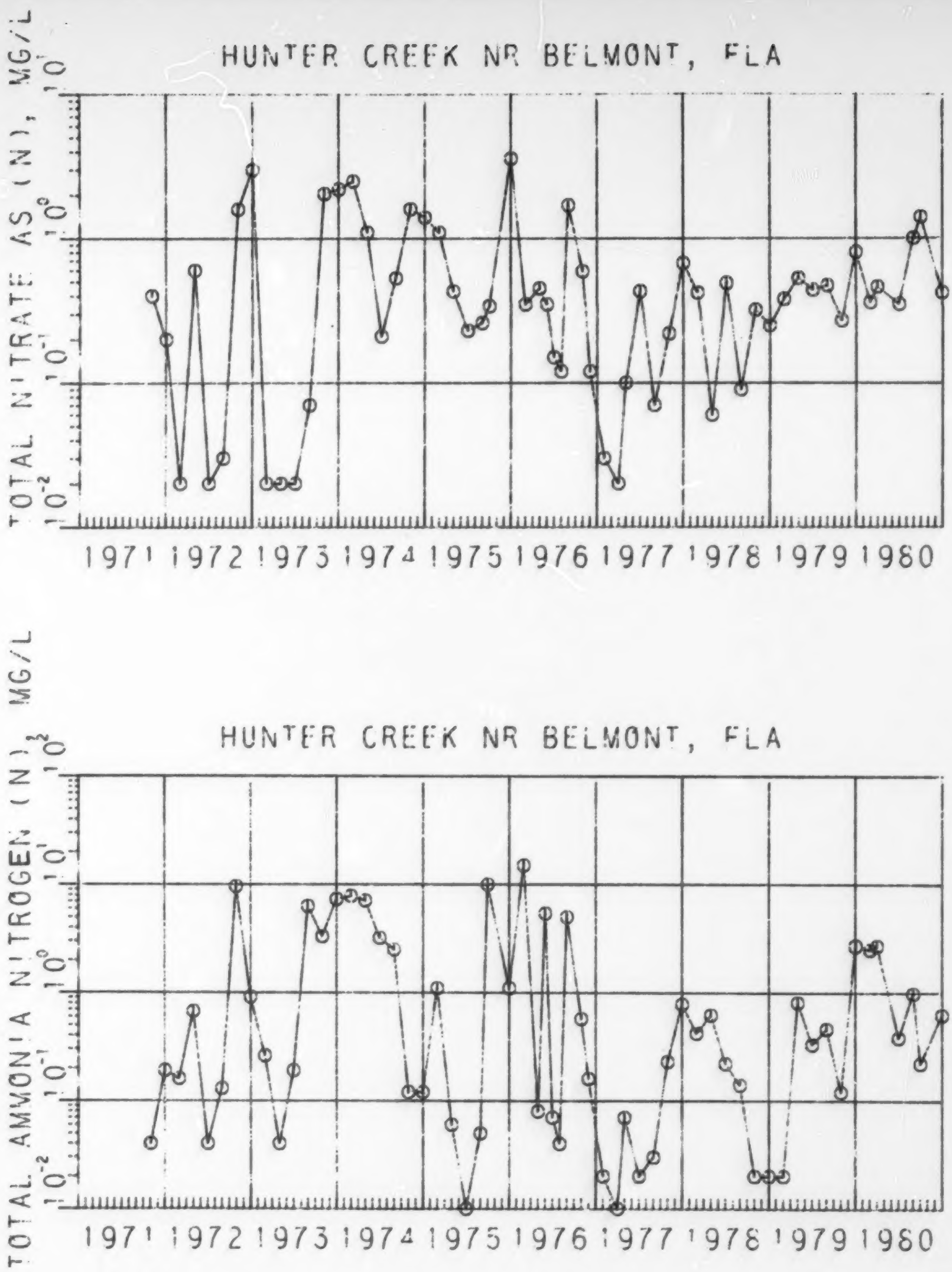


Figure 13.--Total nitrate and total ammonia nitrogen for Hunter Creek near Belmont, 1971-80.

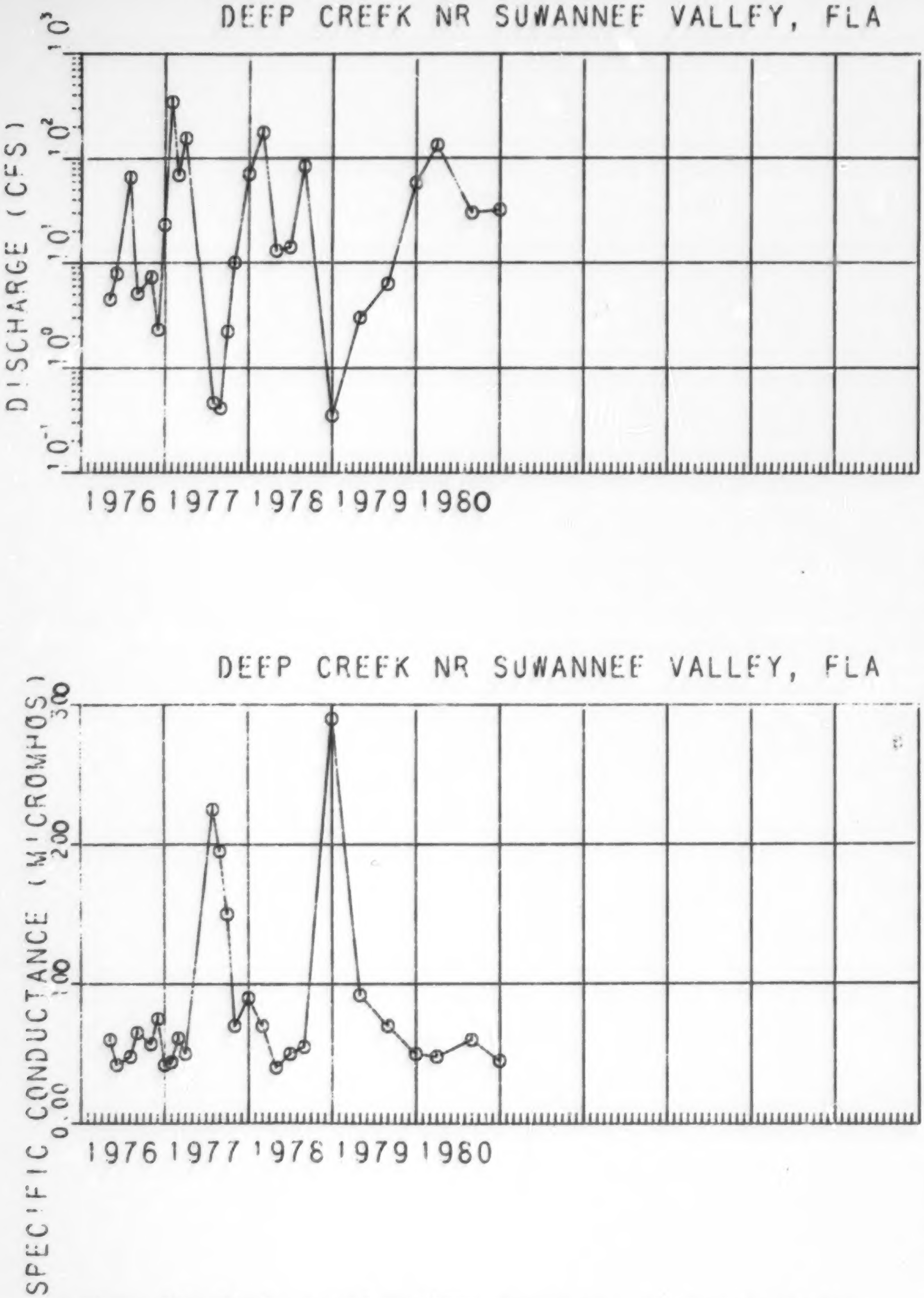


Figure 14.--Discharge and specific conductance for Deep Creek near Suwannee Valley, 1976-80.

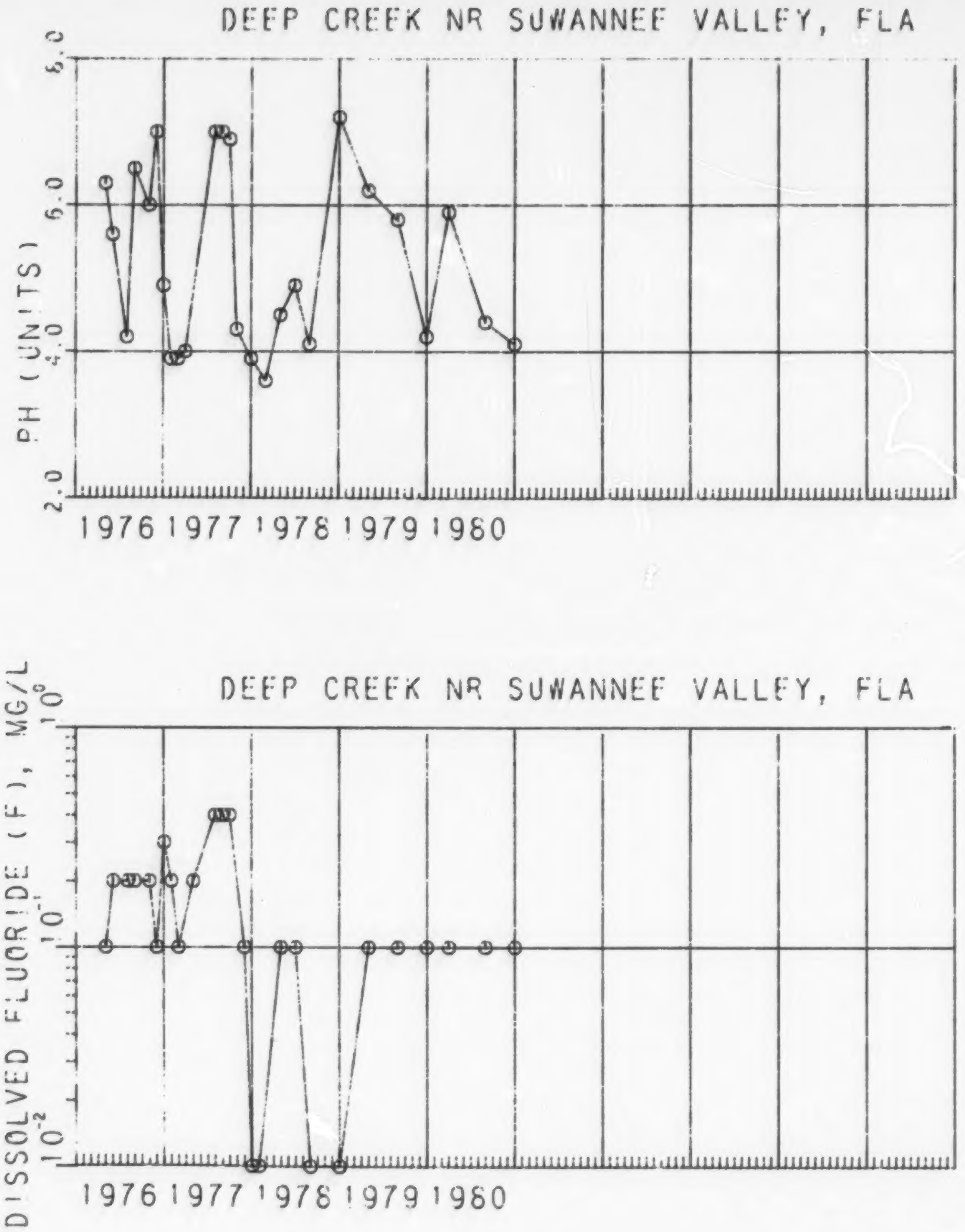


Figure 15.--pH and dissolved fluoride for Deep Creek near Suwannee Valley, 1976-80.

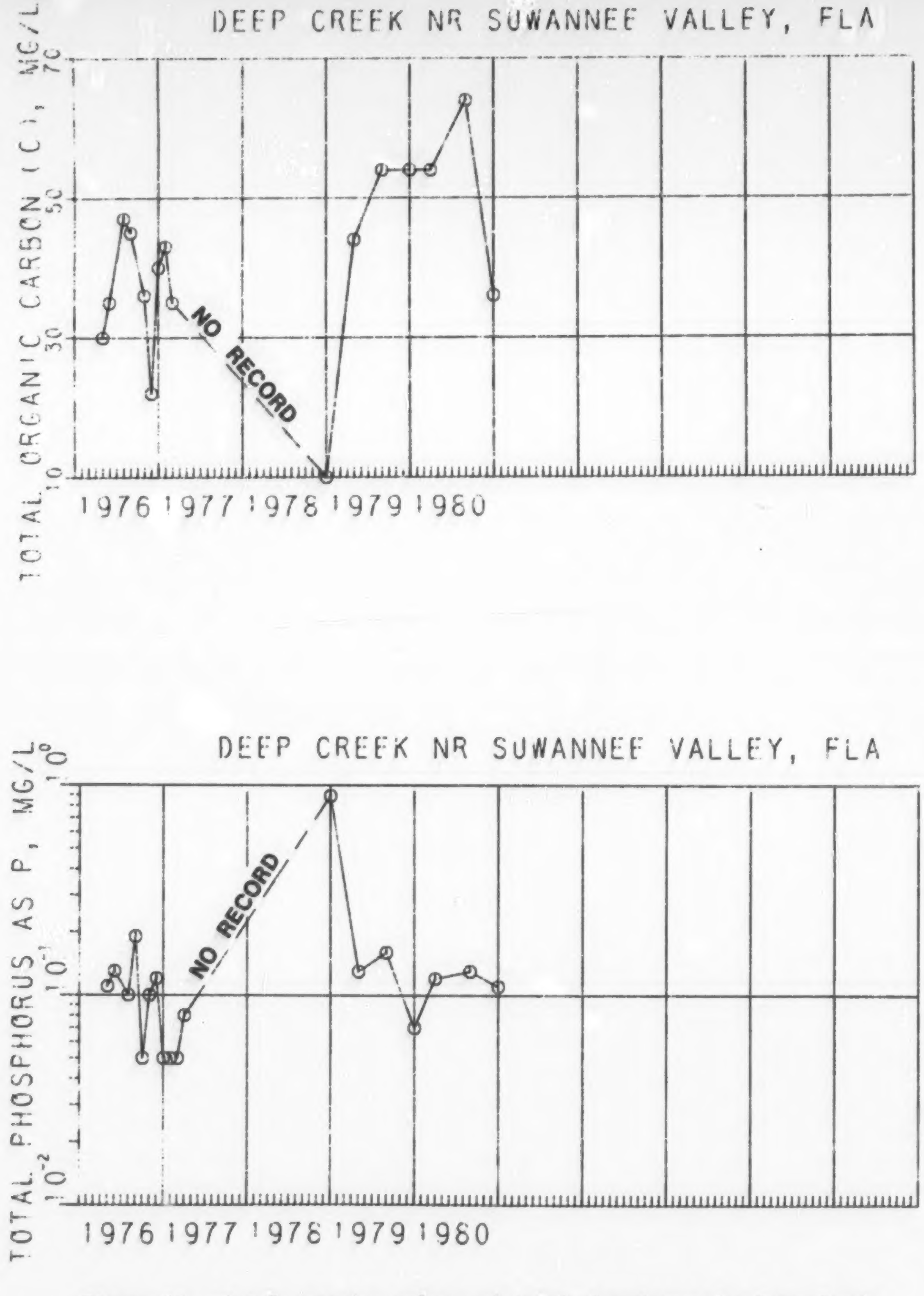


Figure 16.--Total organic carbon and total phosphorus for Deep Creek near Suwannee Valley, 1976-80.

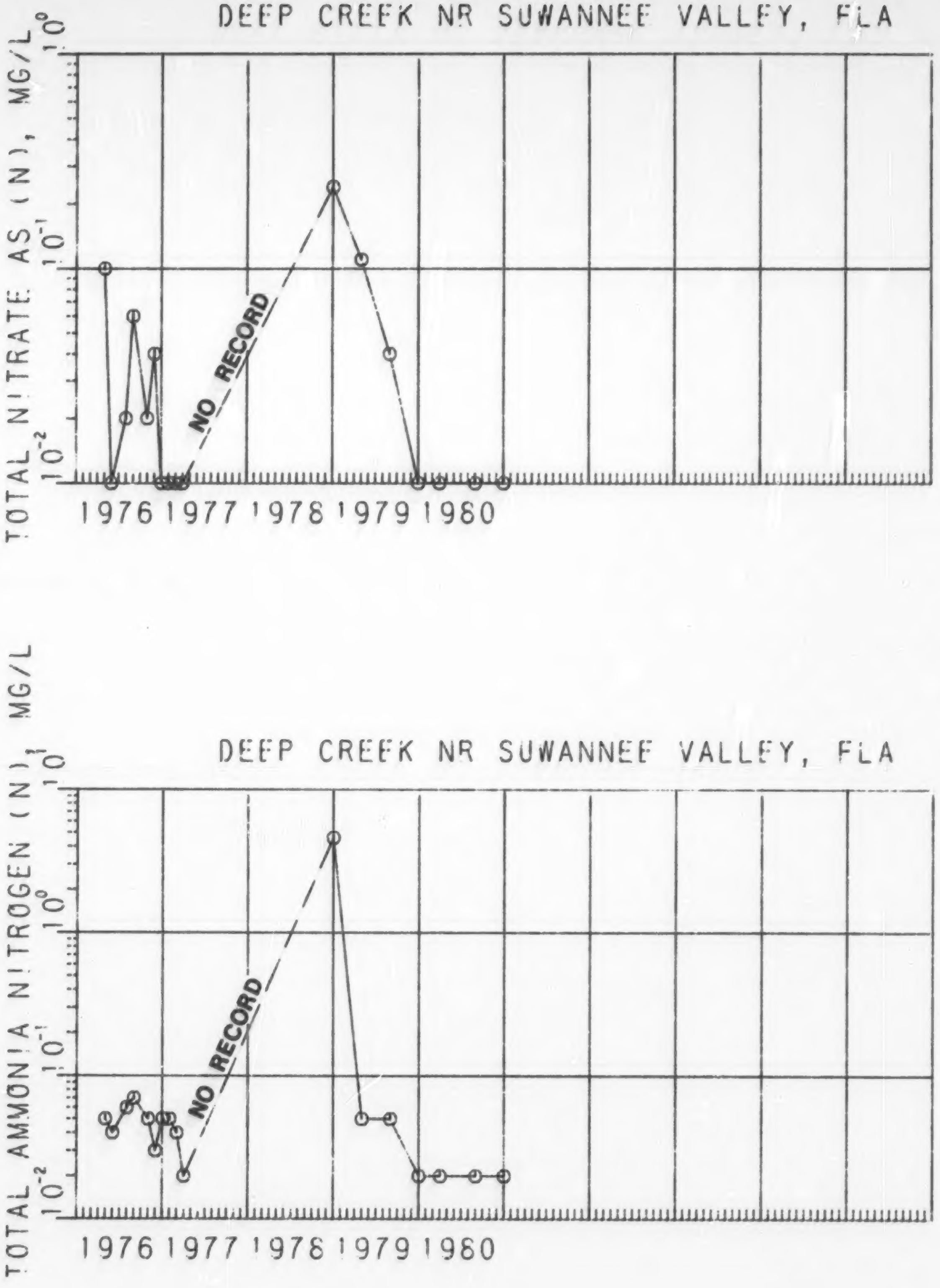
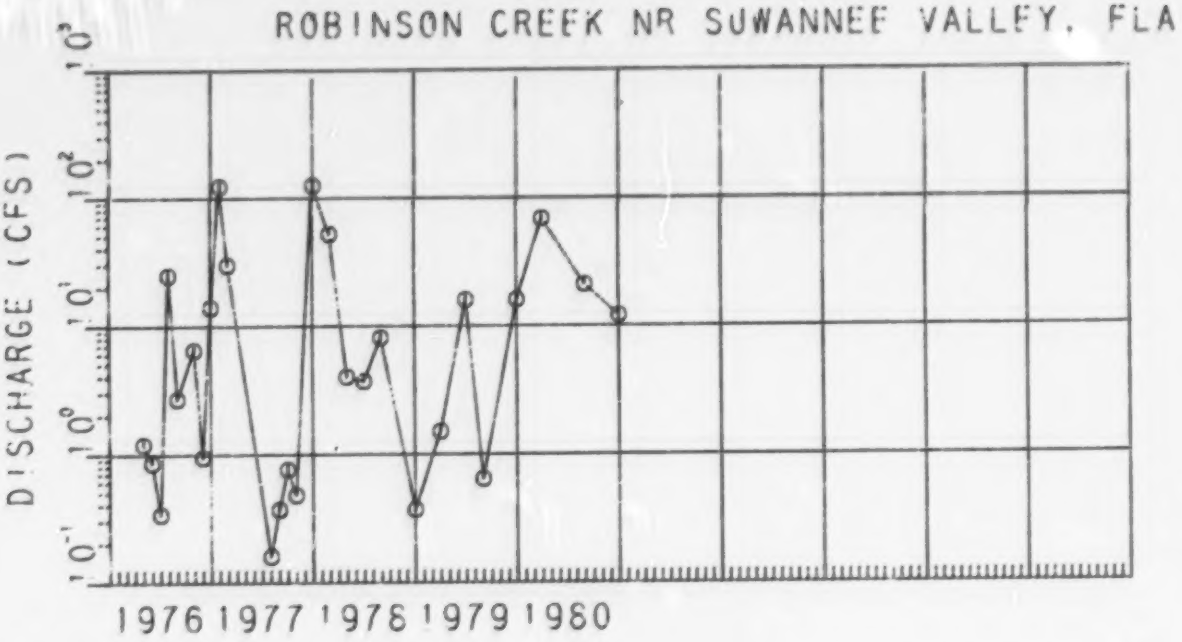


Figure 17.--Total nitrate and total ammonia nitrogen for Deep Creek near Suwannee Valley, 1976-80.



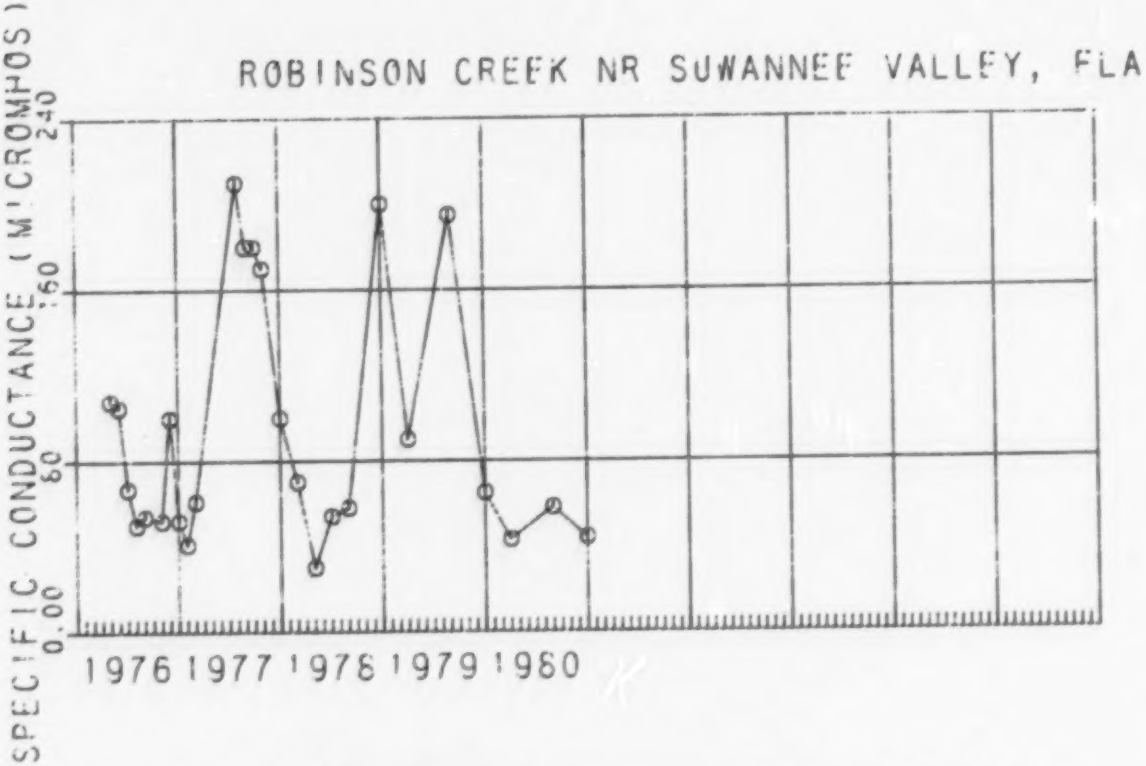
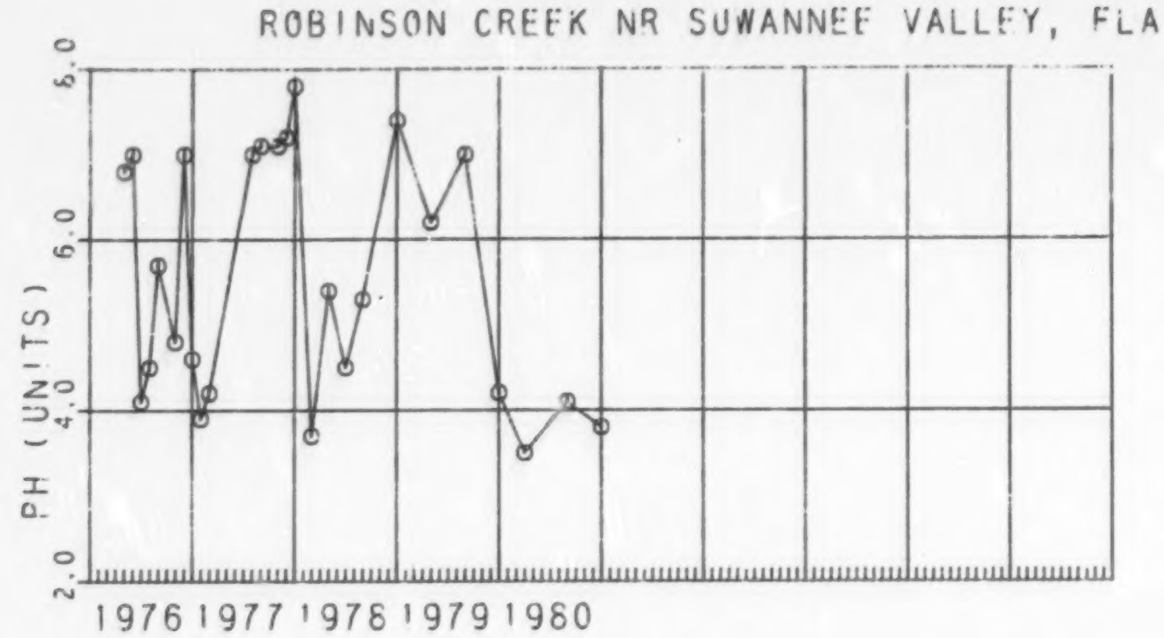


Figure 18.--Discharge and specific conductance for Robinson Creek near Suwannee Valley, 1976-80.



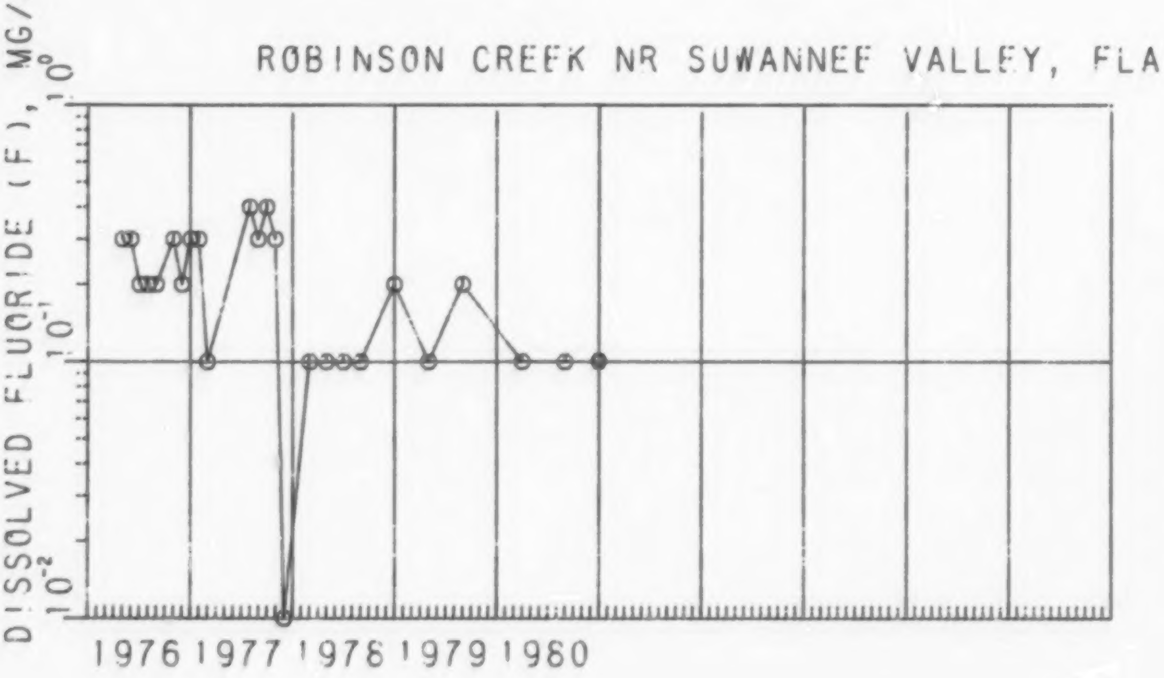


Figure 19.--pH and dissolved fluoride for Robinson Creek near Suwannee Valley, 1976-80.

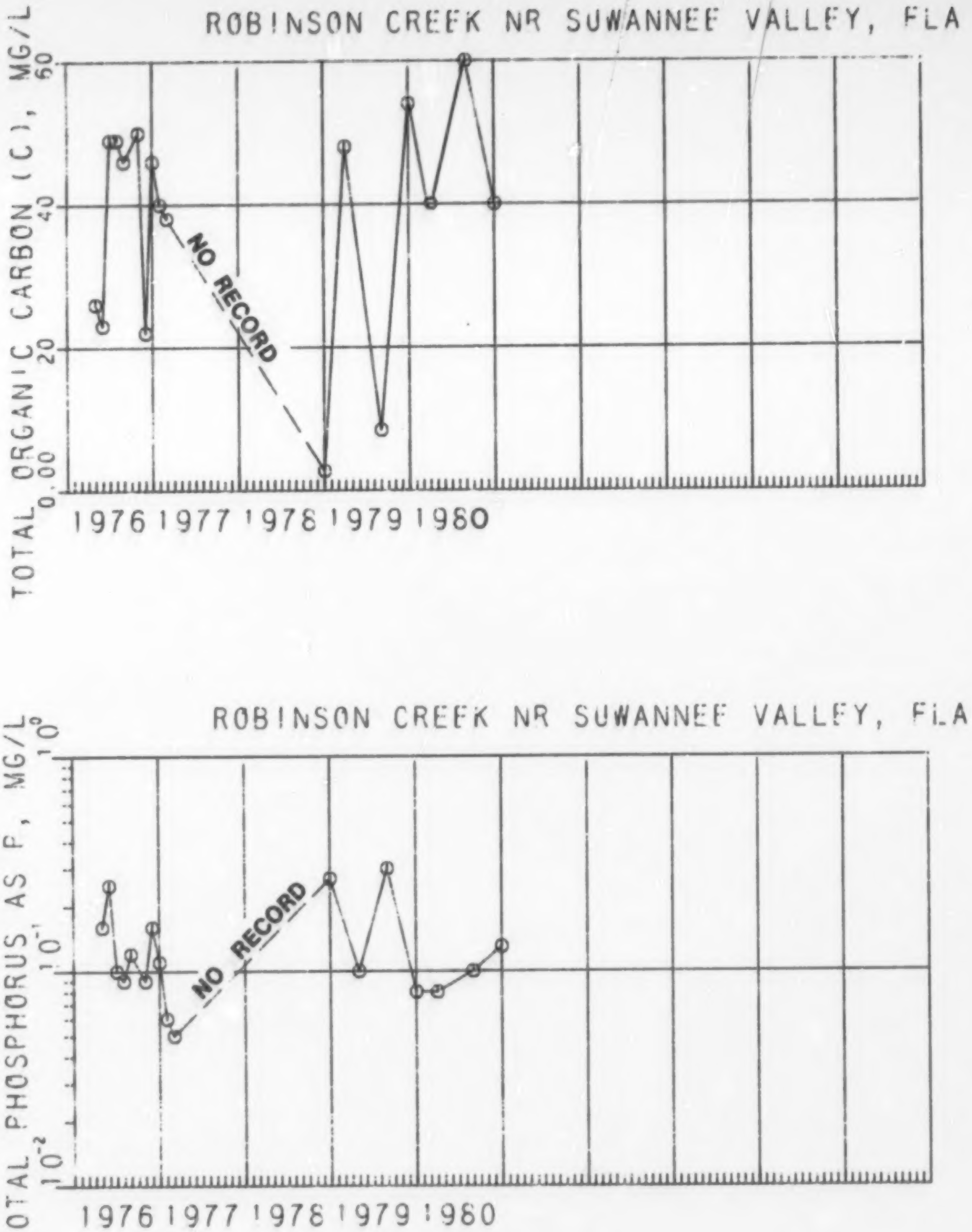


Figure 20.--Total organic carbon and total phosphorus for Robinson Creek near Suwannee Valley, 1976-81.

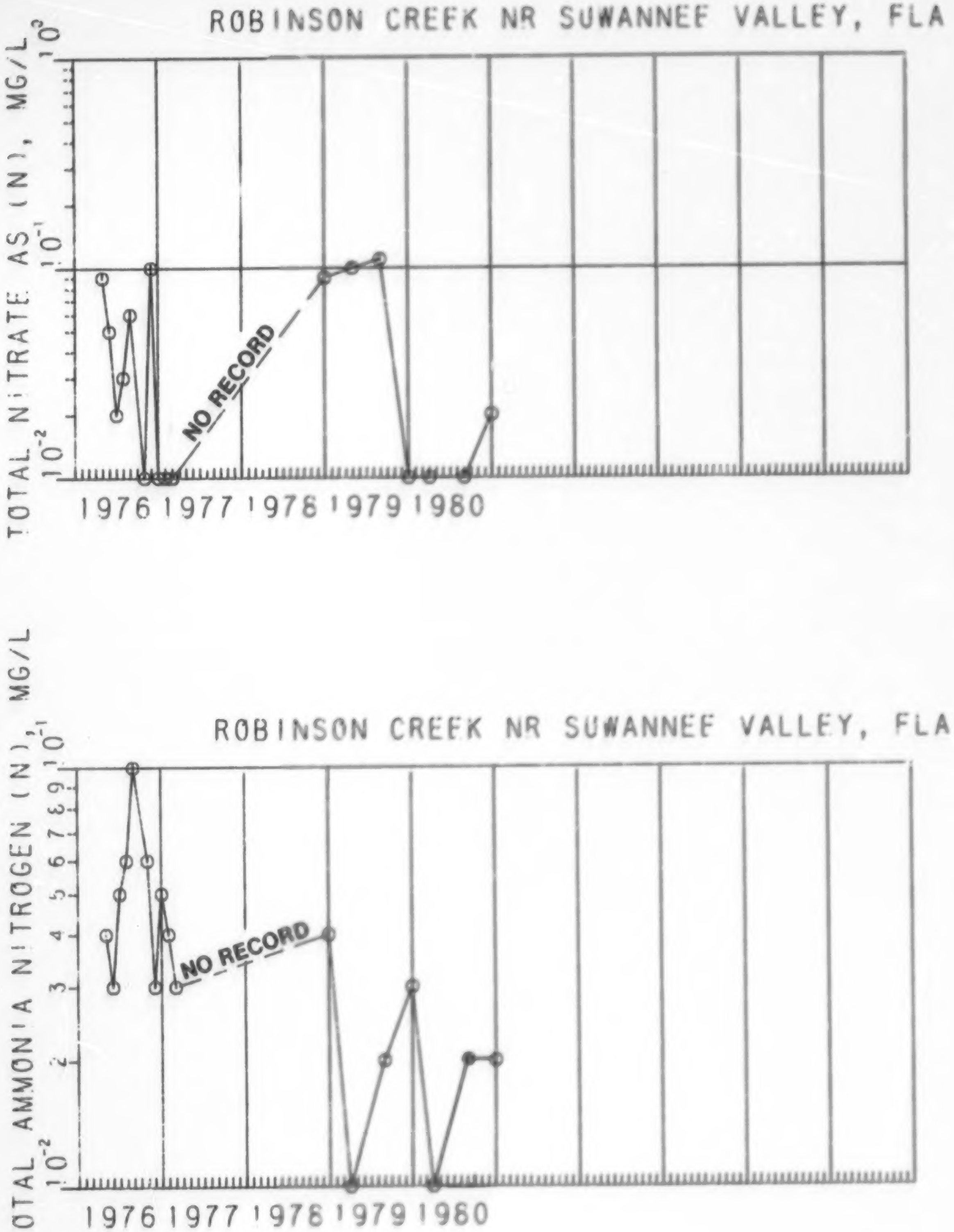


Figure 21.--Total nitrate and total ammonia nitrogen for Robinson Creek near Suwannee Valley, 1976-80.

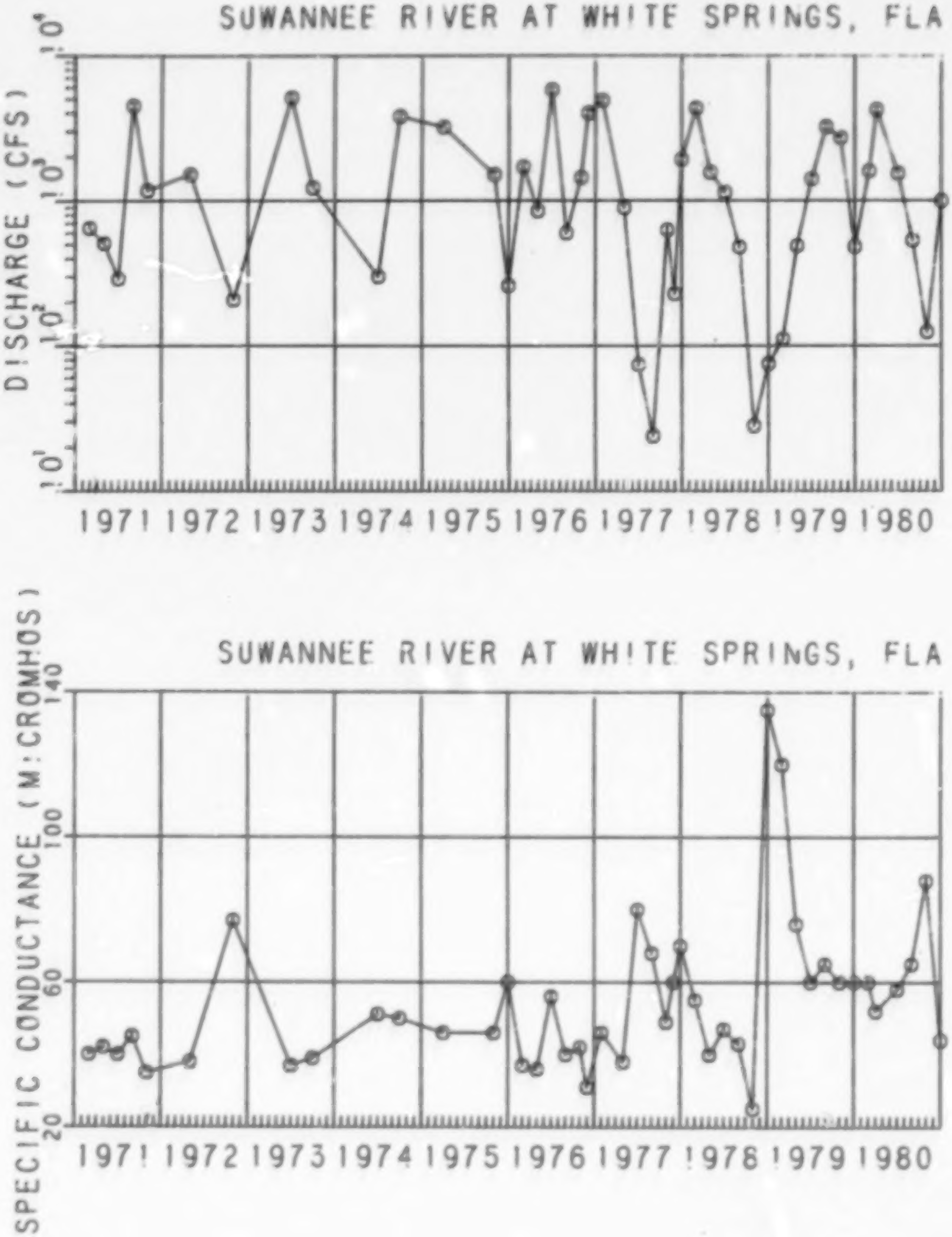


Figure 22.--Discharge and specific conductance for Suwannee River at White Springs, 1971-80.

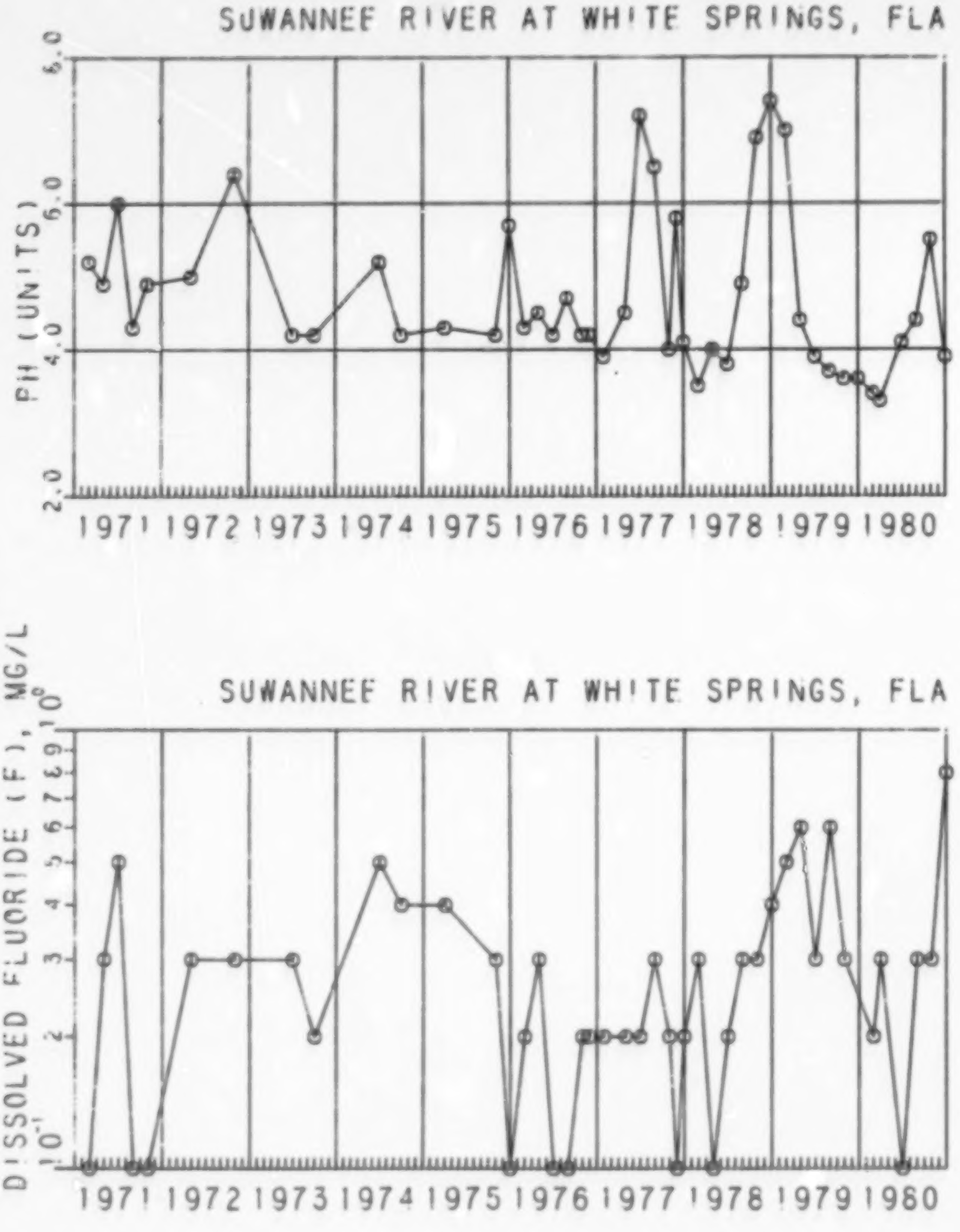


Figure 23.--pH and dissolved fluoride for Suwannee River at White Springs, 1971-80.

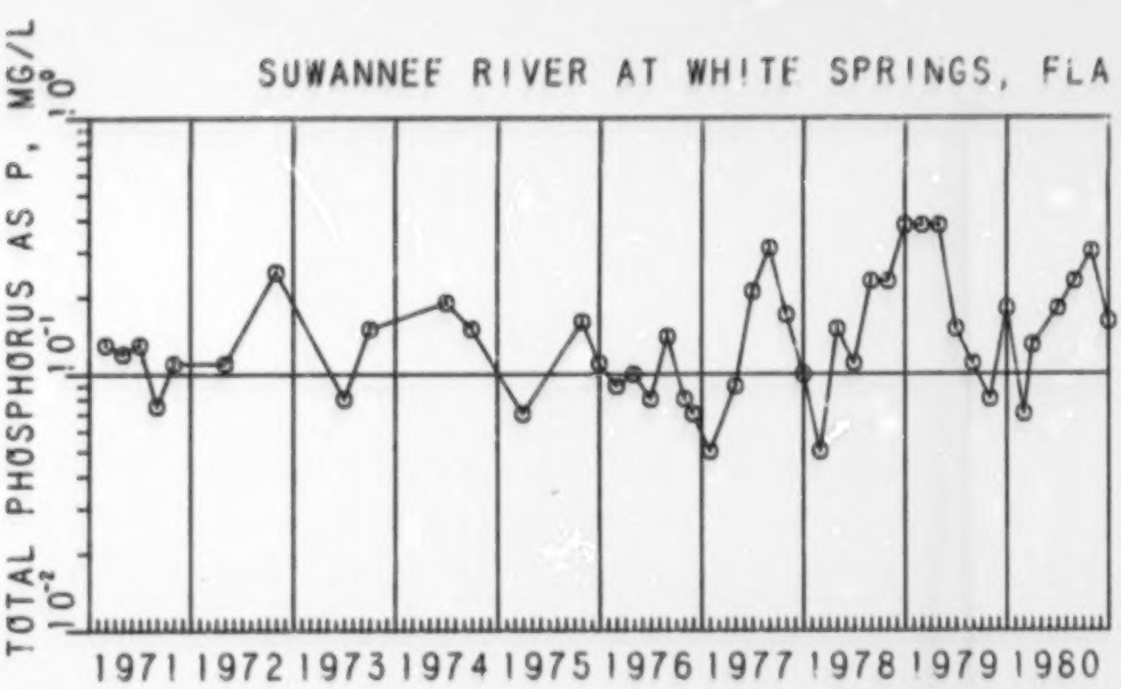
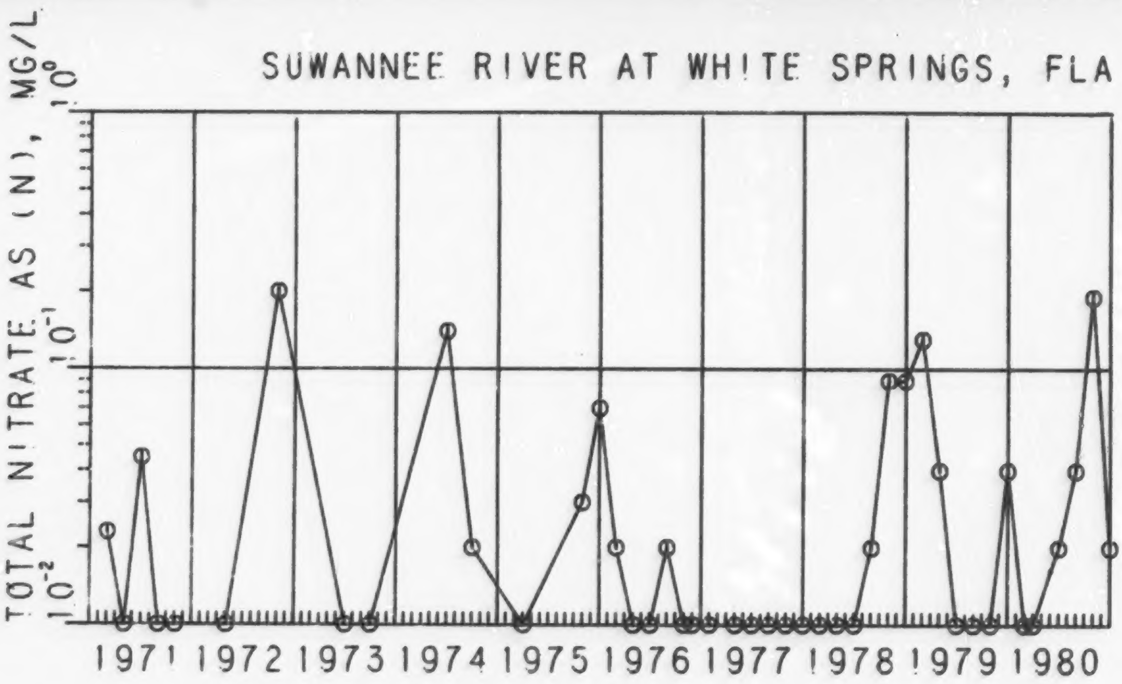


Figure 24.--Total phosphorus for Suwannee River at White Springs, 1971-80.



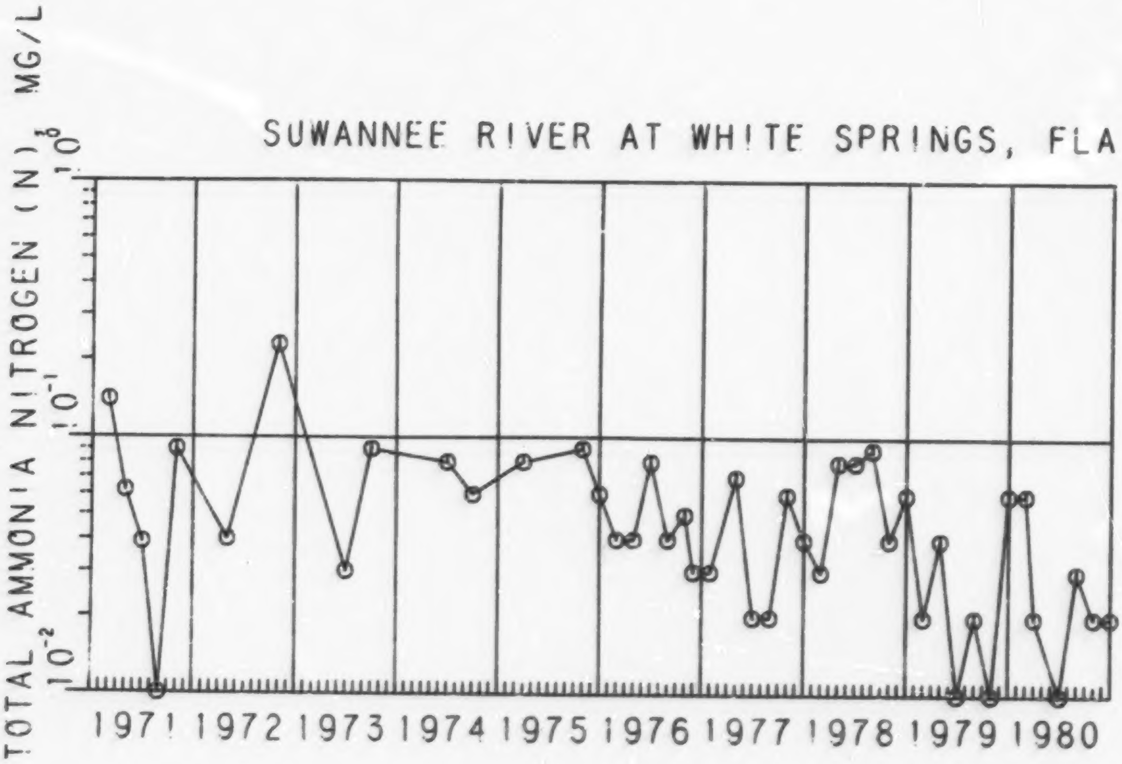


Figure 25.--Total nitrate and total ammonia nitrogen for Suwannee River at White Springs, 1971-80.

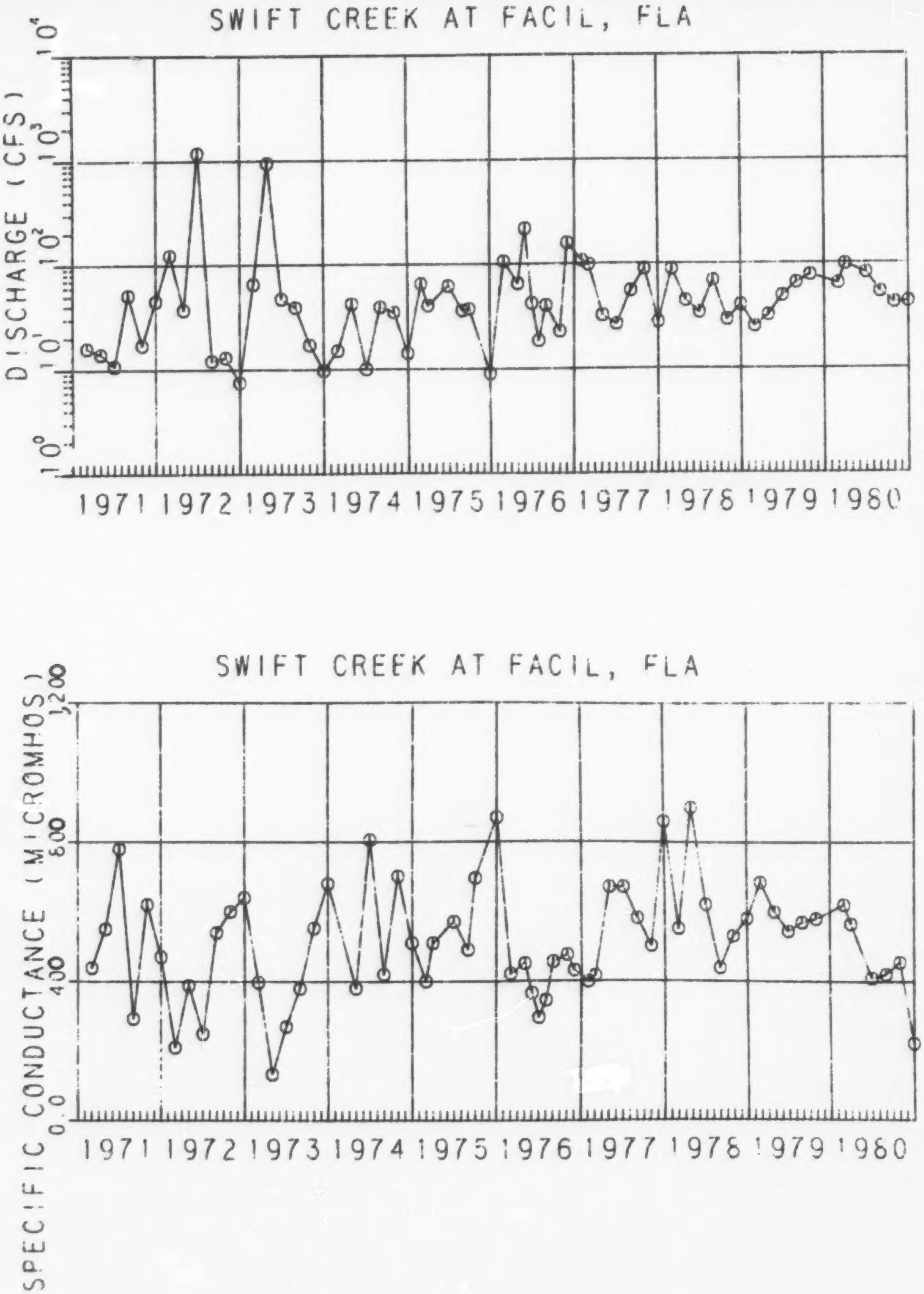


Figure 26.--Discharge and specific conductance for Swift Creek at Facil, 1971-80.

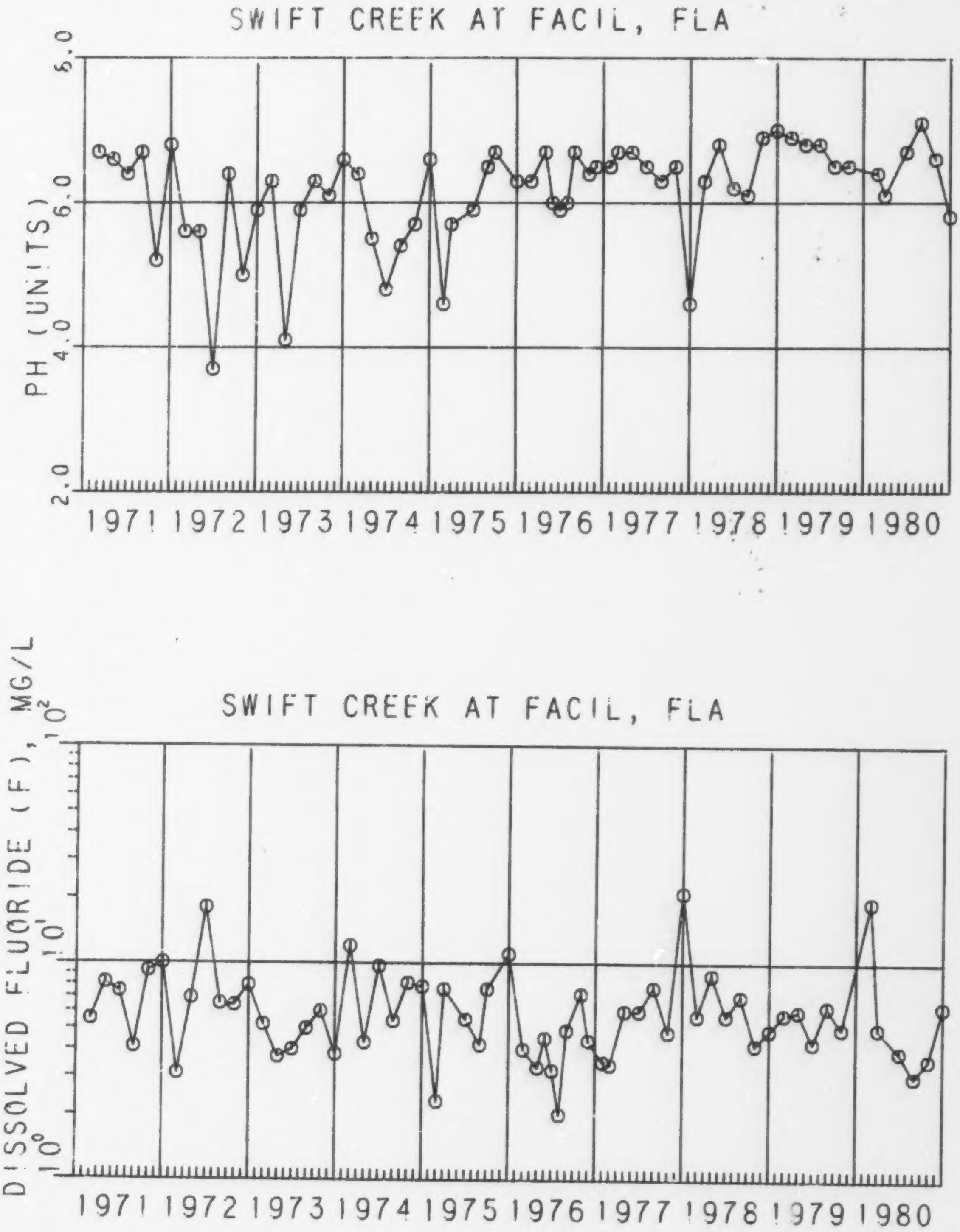
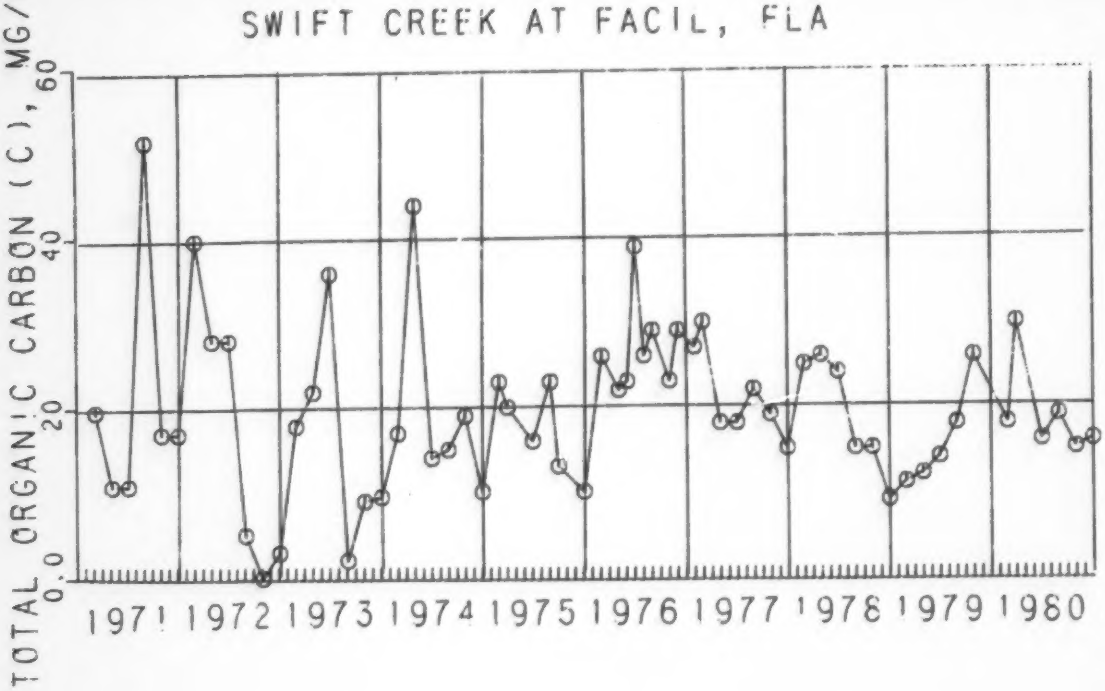


Figure 27.--pH and dissolved fluoride for Swift Creek at Facil, 1971-80.



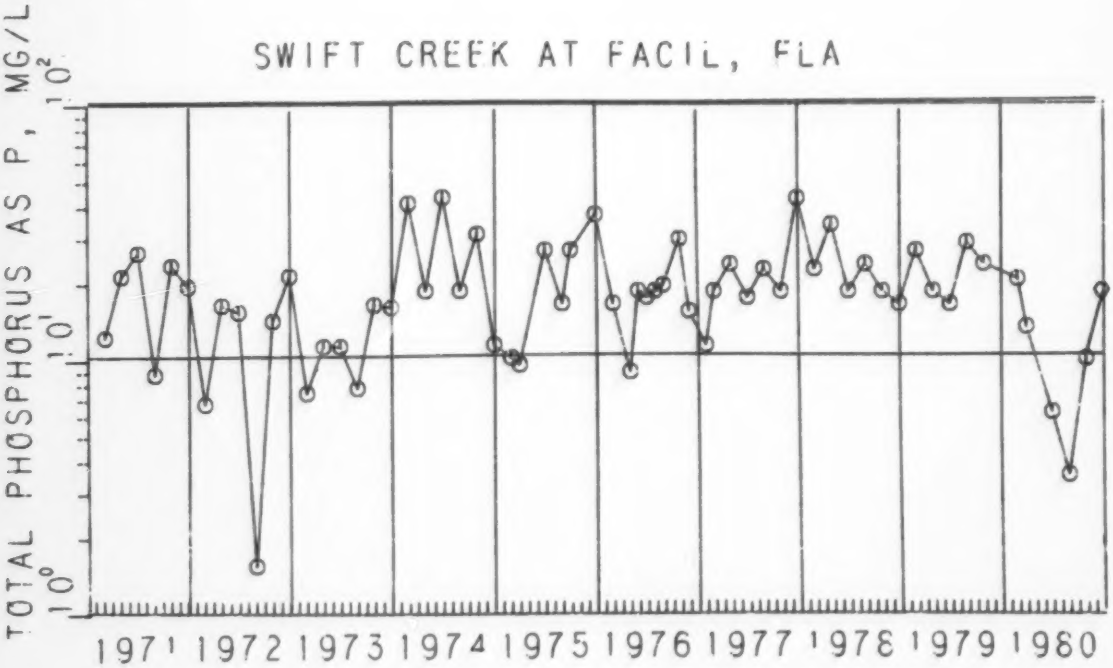


Figure 28.--Total organic carbon and total phosphorus for Swift Creek at Facil, 1971-80.

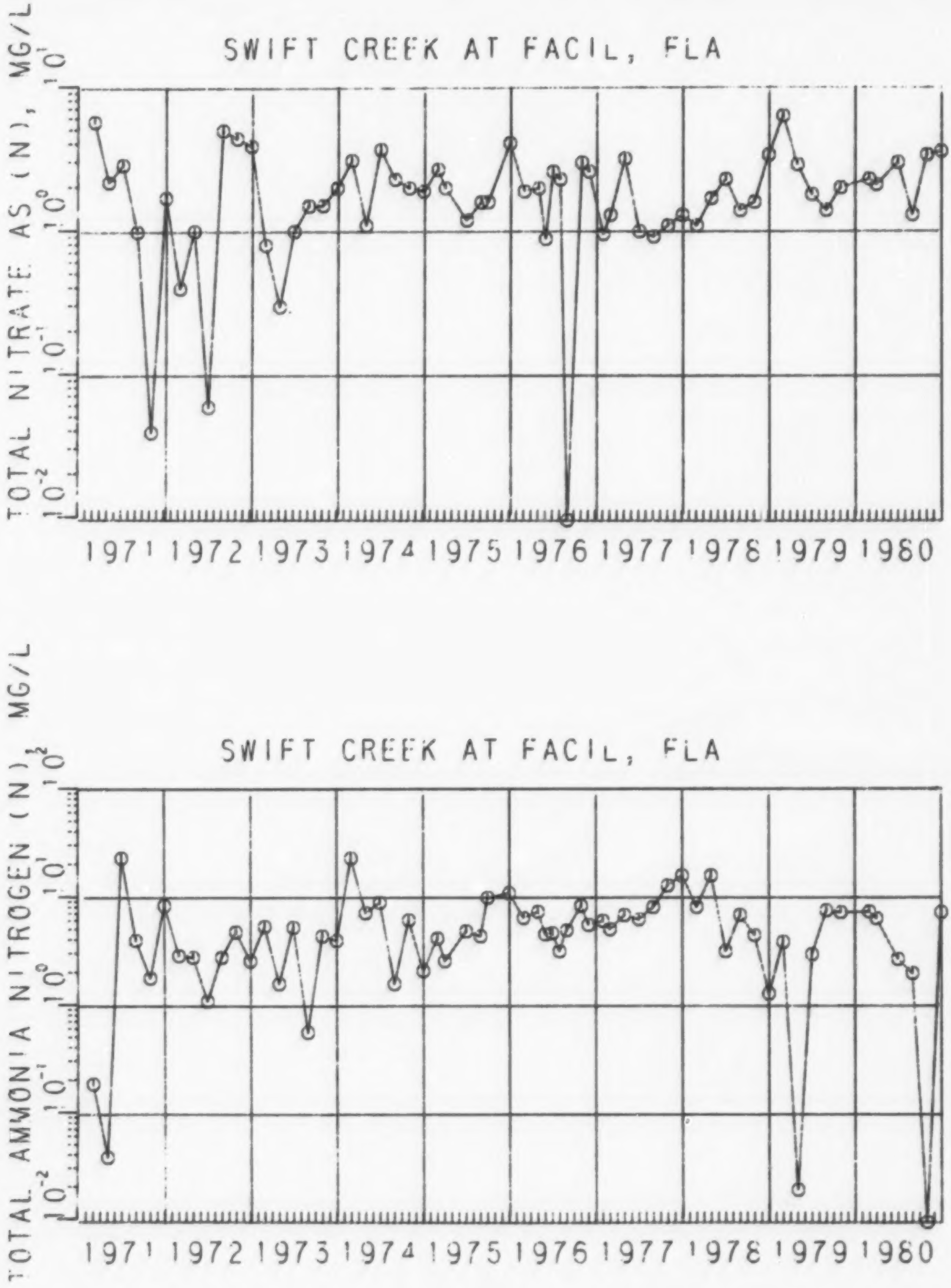


Figure 29.--Total nitrate and total ammonia nitrogen for Swift Creek at Facil, 1971-80.

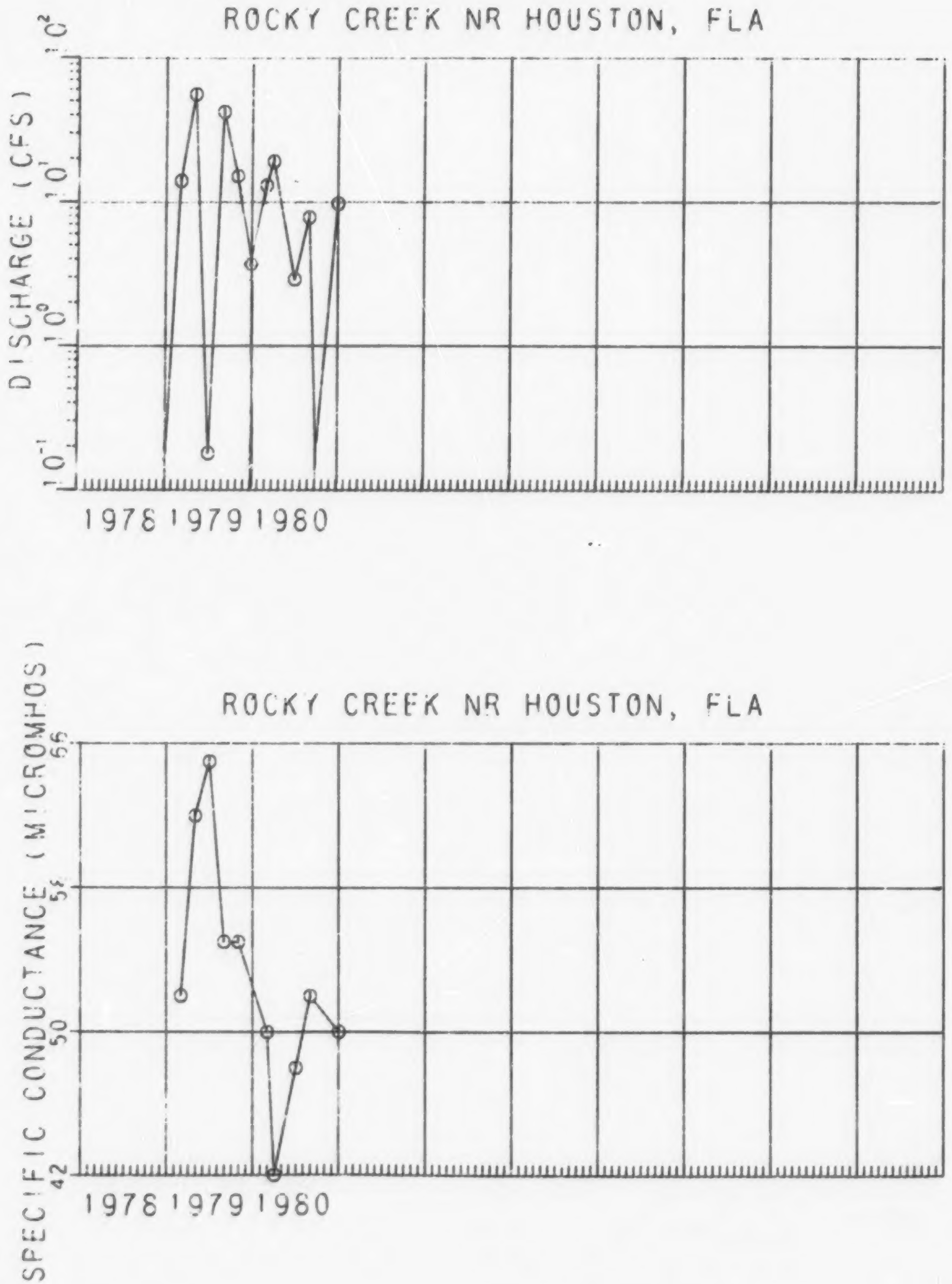
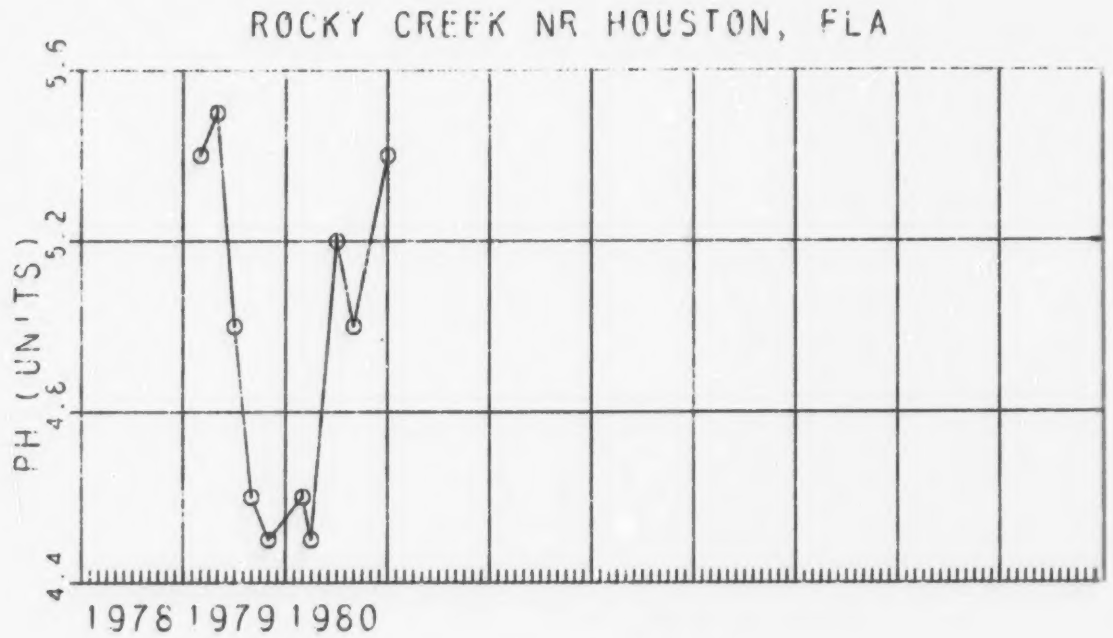


Figure 30.--Discharge and specific conductance for Rocky Creek near Houston, 1978-80.



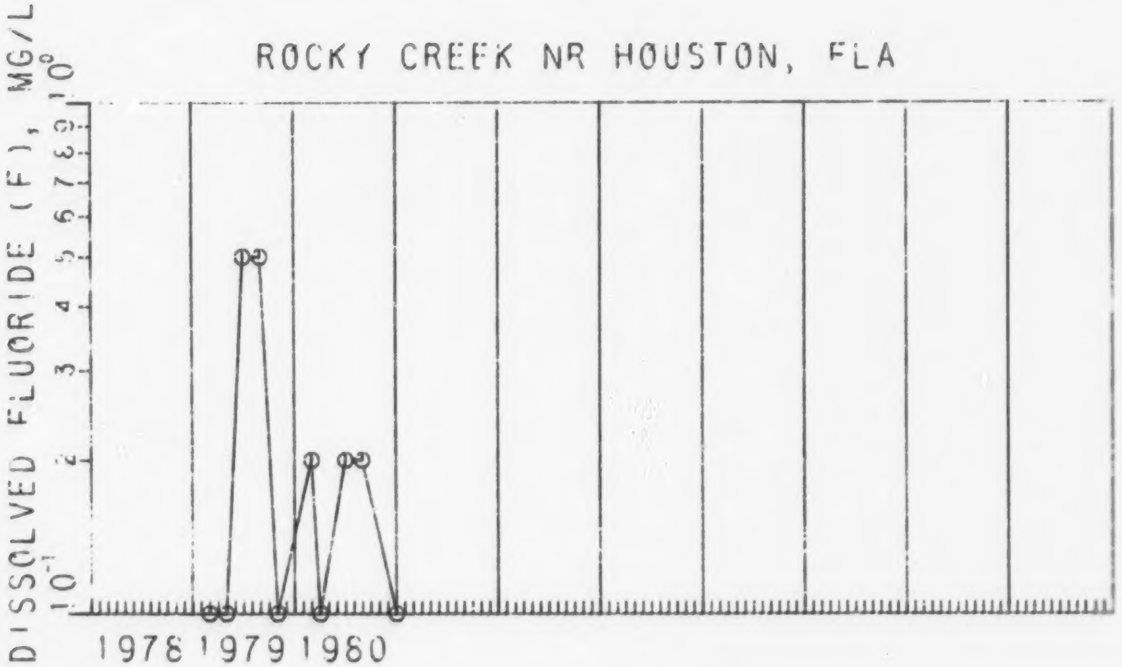


Figure 31.--pH and dissolved fluoride for Rocky Creek near Houston, 1978-80.

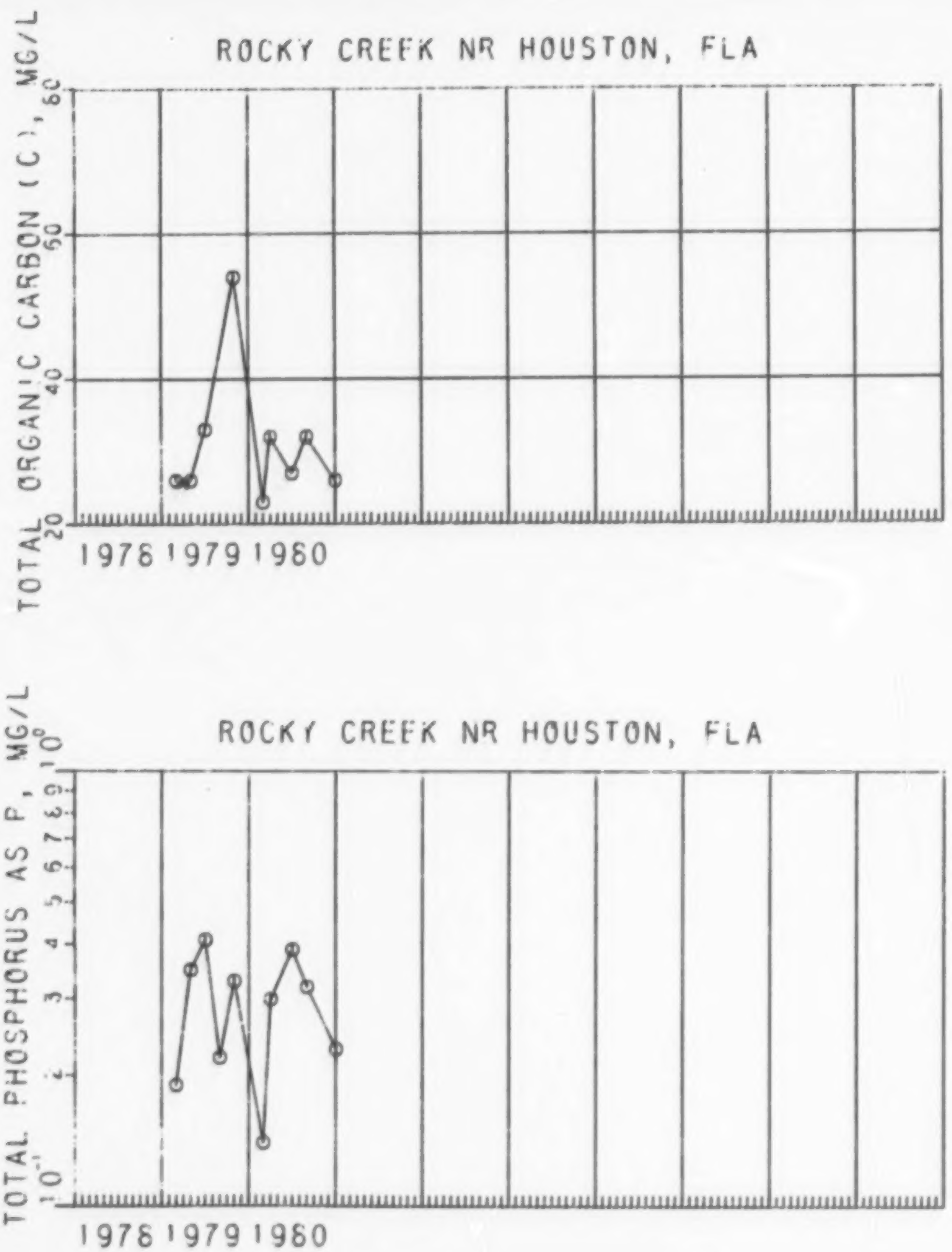


Figure 32.--Total organic carbon and total phosphorus for Rocky Creek near Houston, 1978-80.

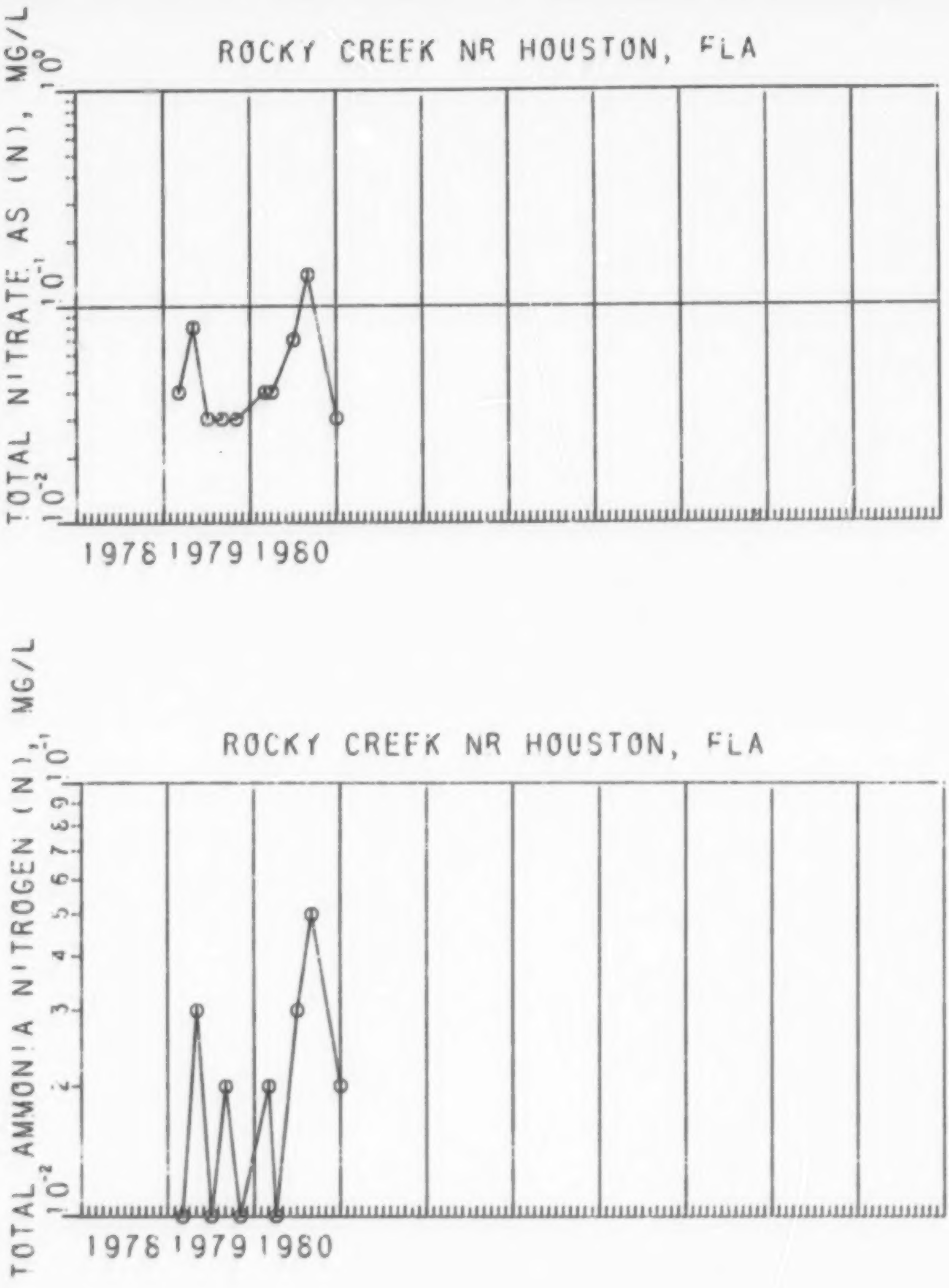


Figure 33.--Total nitrate and total ammonia nitrogen for Rocky Creek near Houston, 1978-80.

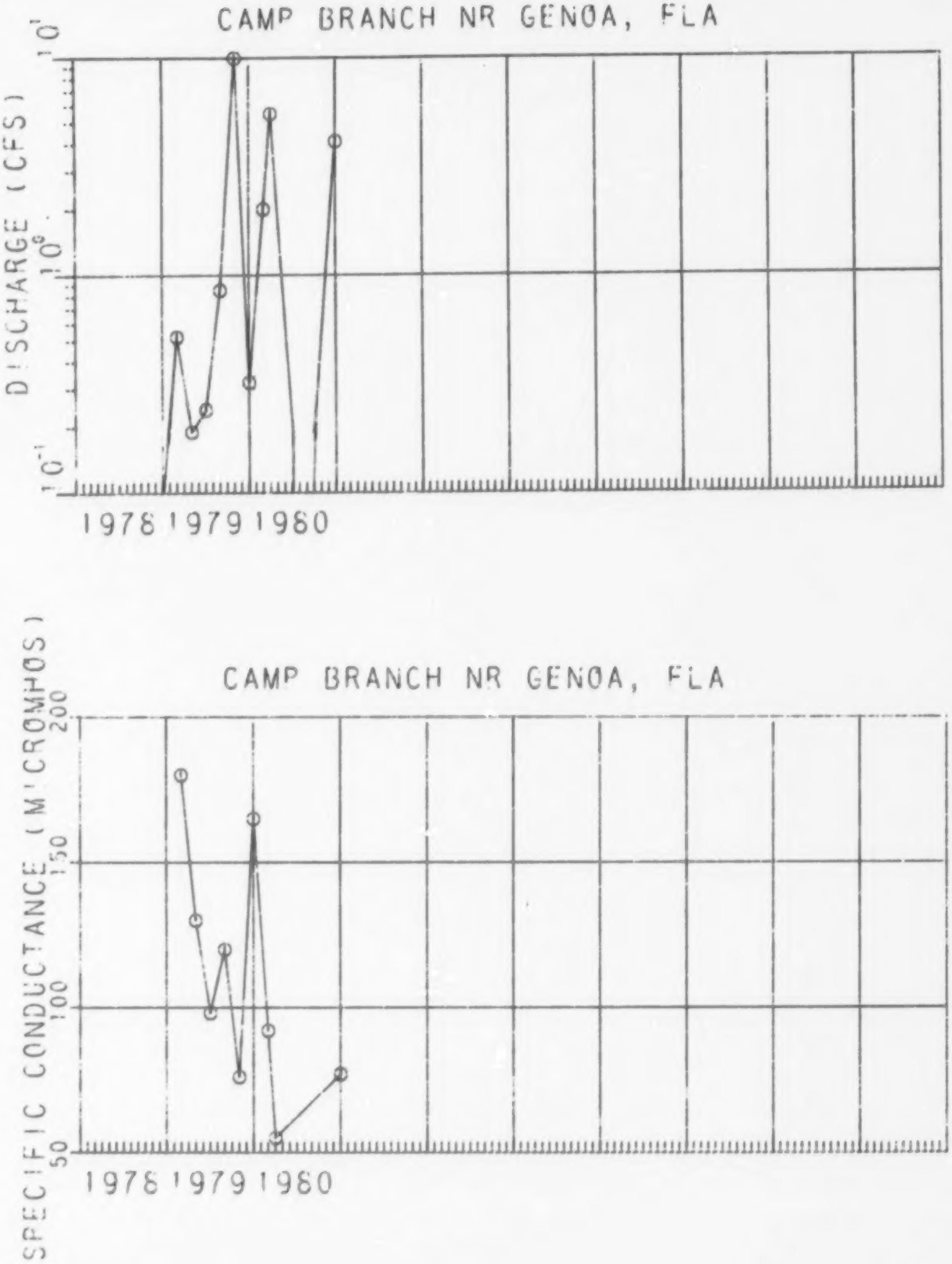


Figure 34.--Discharge and specific conductance for Camp Branch near Genoa, 1978-80.

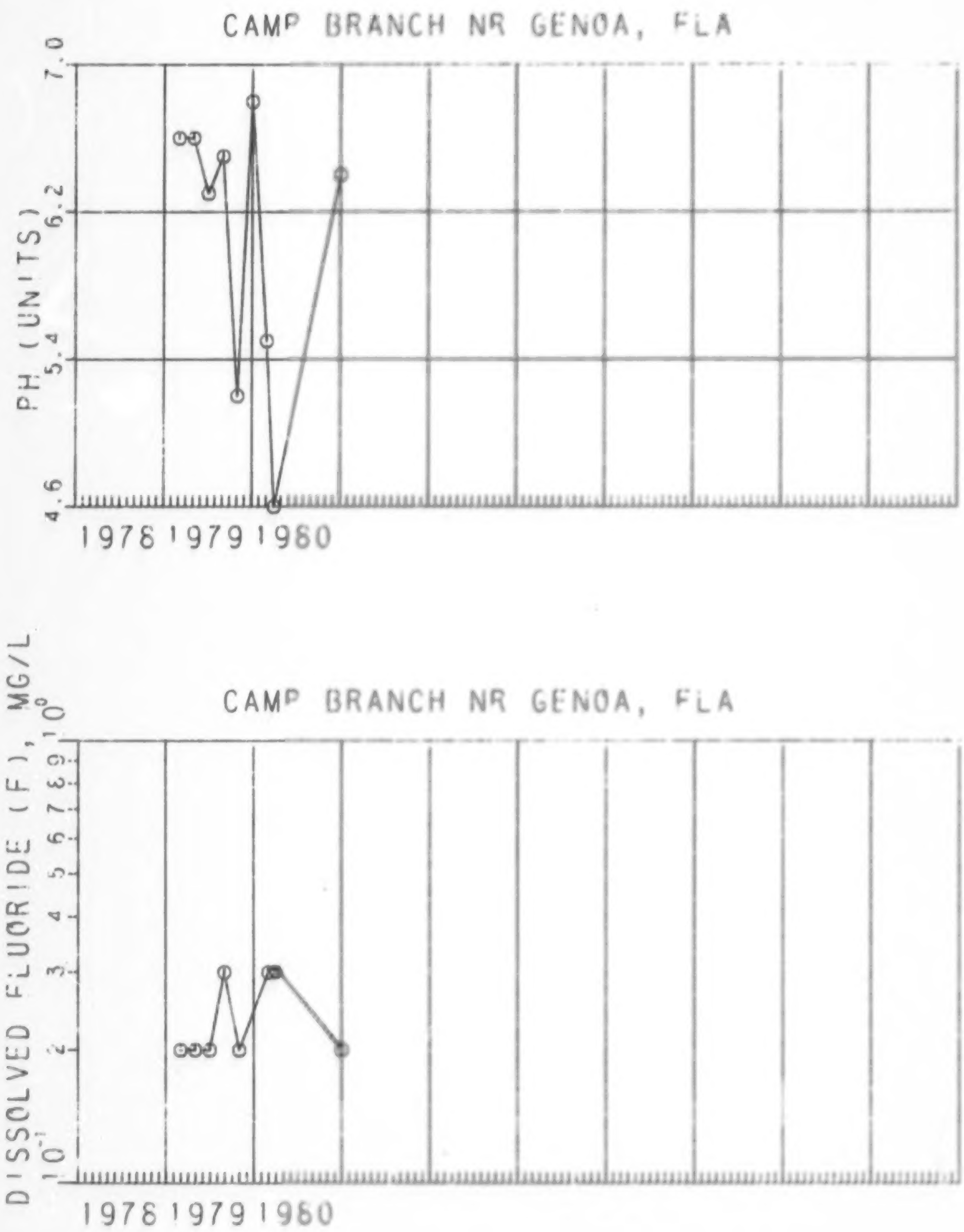
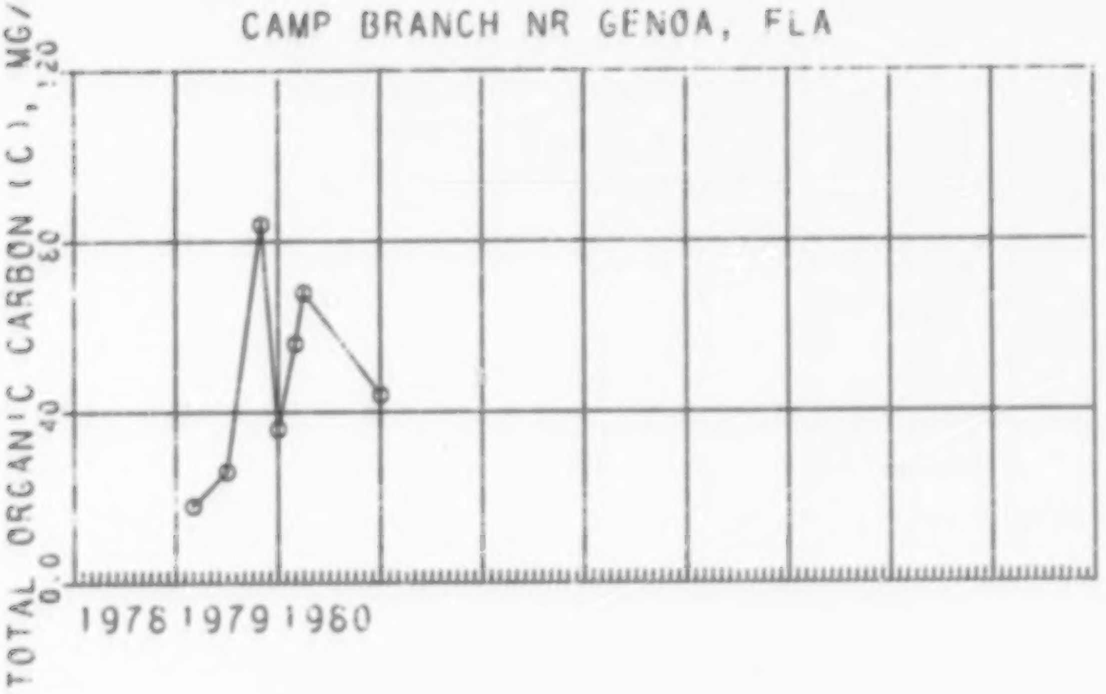


Figure 35.--pH and dissolved fluoride for Camp Branch near Genoa, 1978-80.



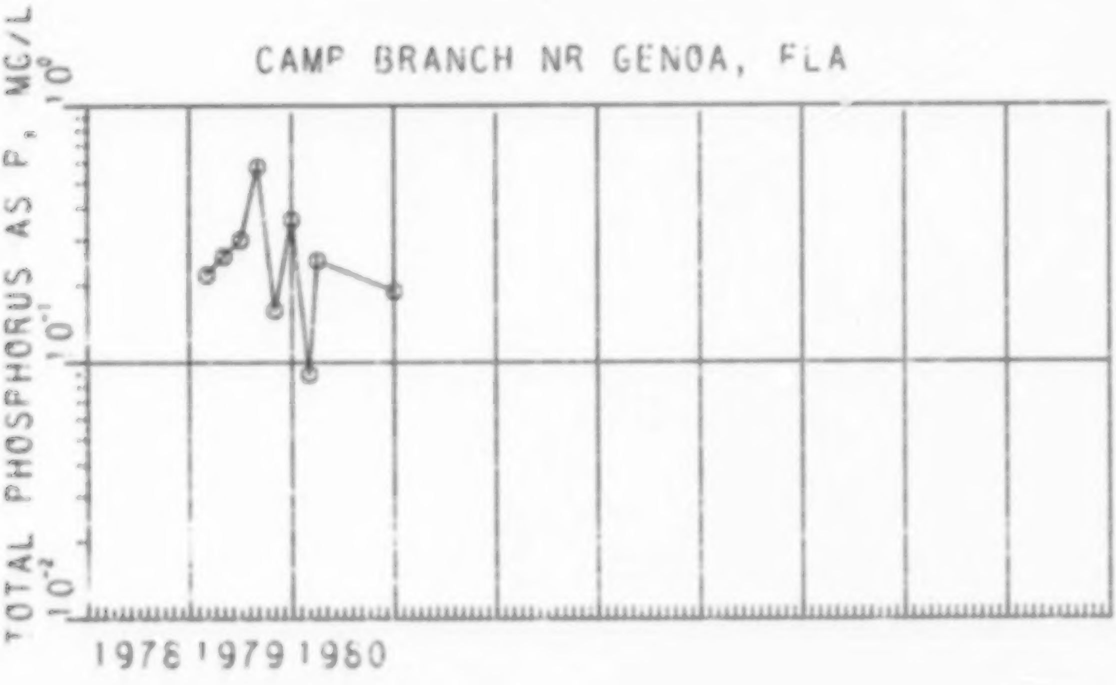
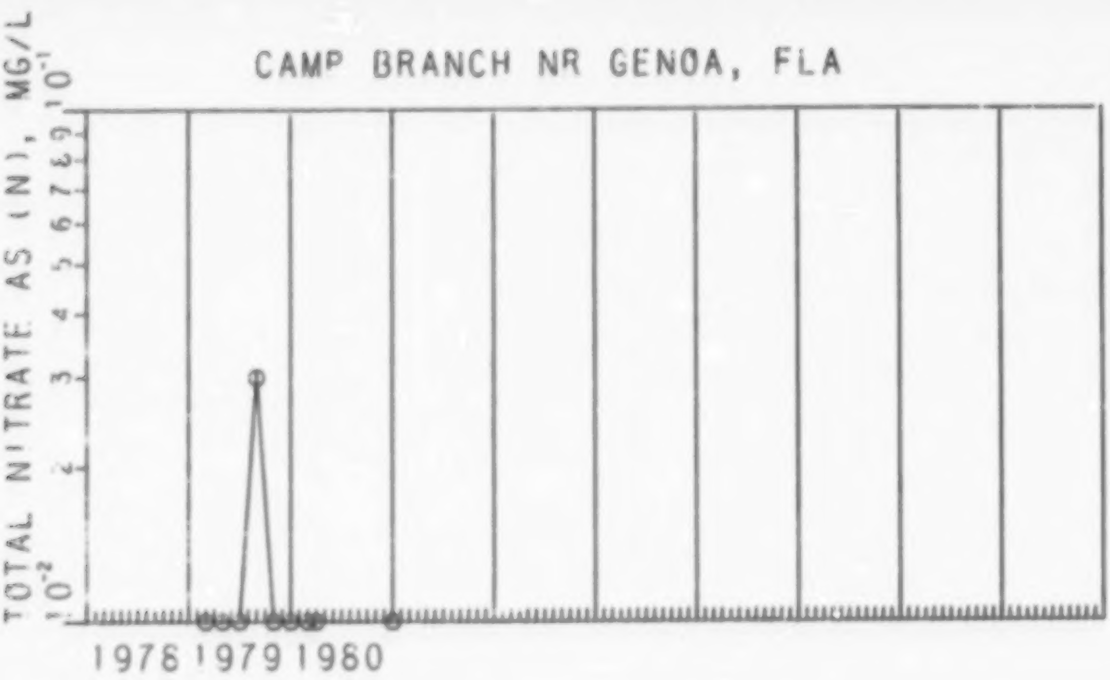


Figure 36.--Total organic carbon and total phosphorus for Camp Branch near Genoa, 1978-80.



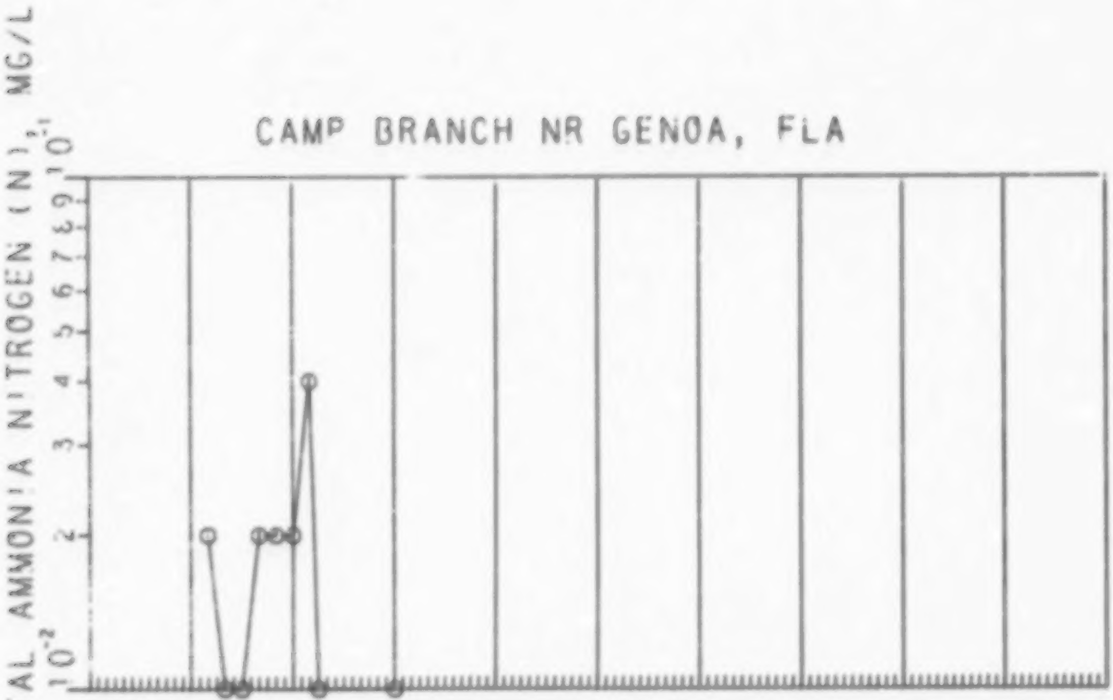
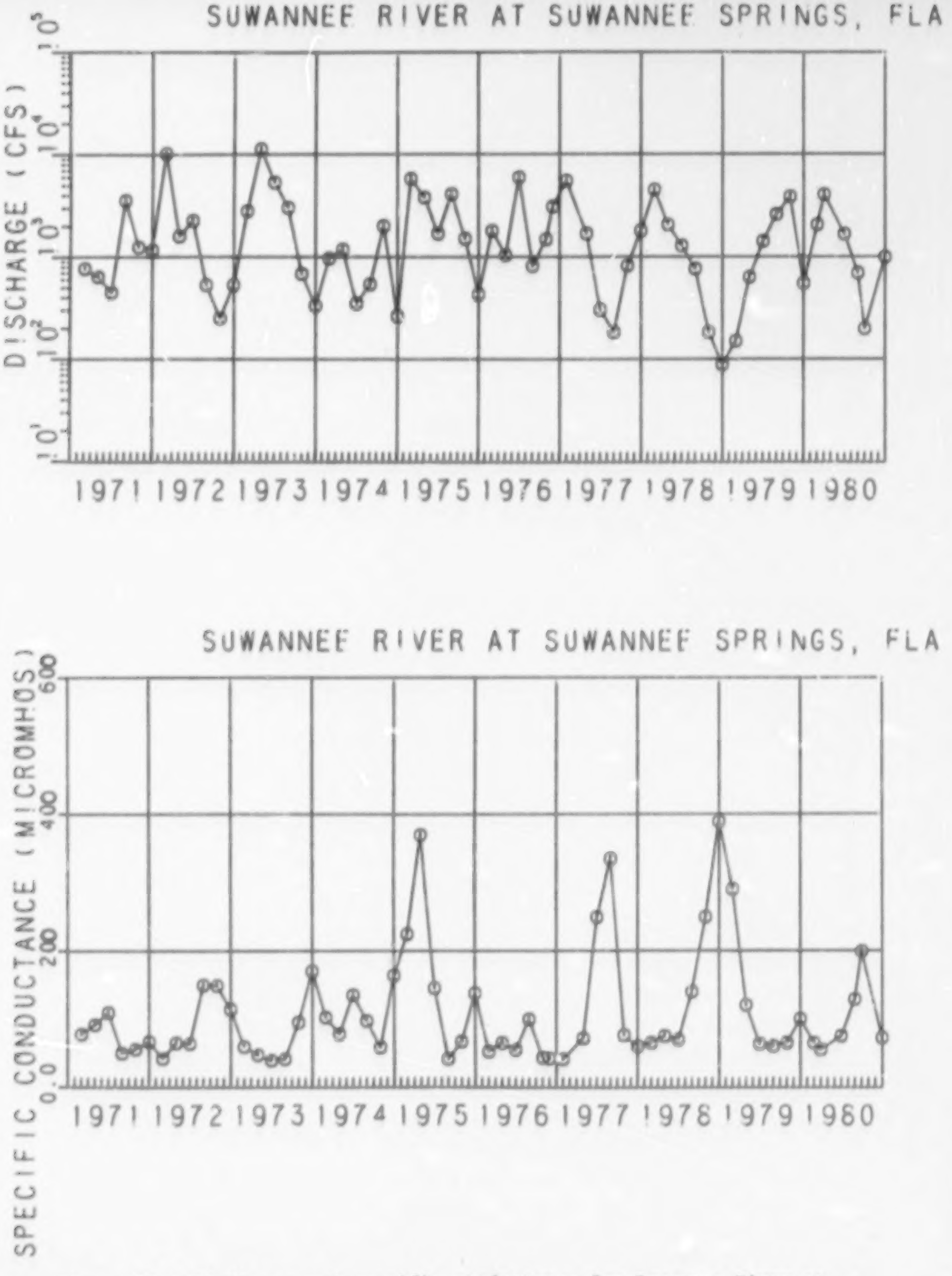
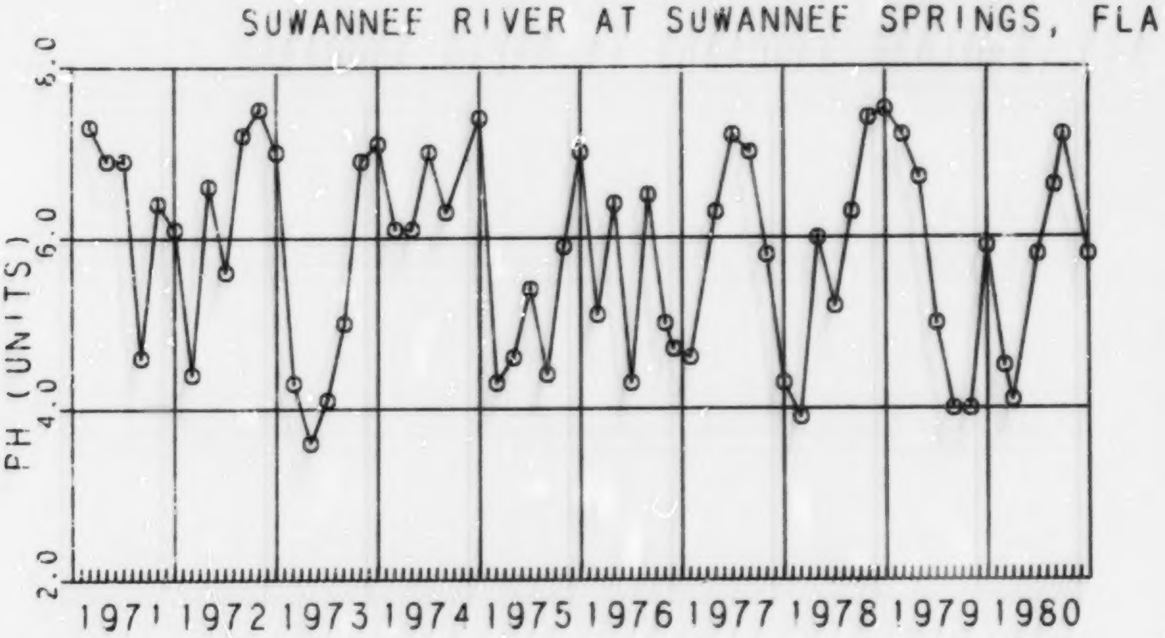


Figure 37.--Total nitrate and total ammonia nitrogen for Camp Branch near Genoa, 1978-80.


SUWANNEE RIVER AT SUWANNEE SPRINGS, FLA

SUWANNEE RIVER AT SUWANNEE SPRINGS, FLA

Figure 38.--Discharge and specific conductance for Suwannee River at Suwannee Springs, 1971-80.



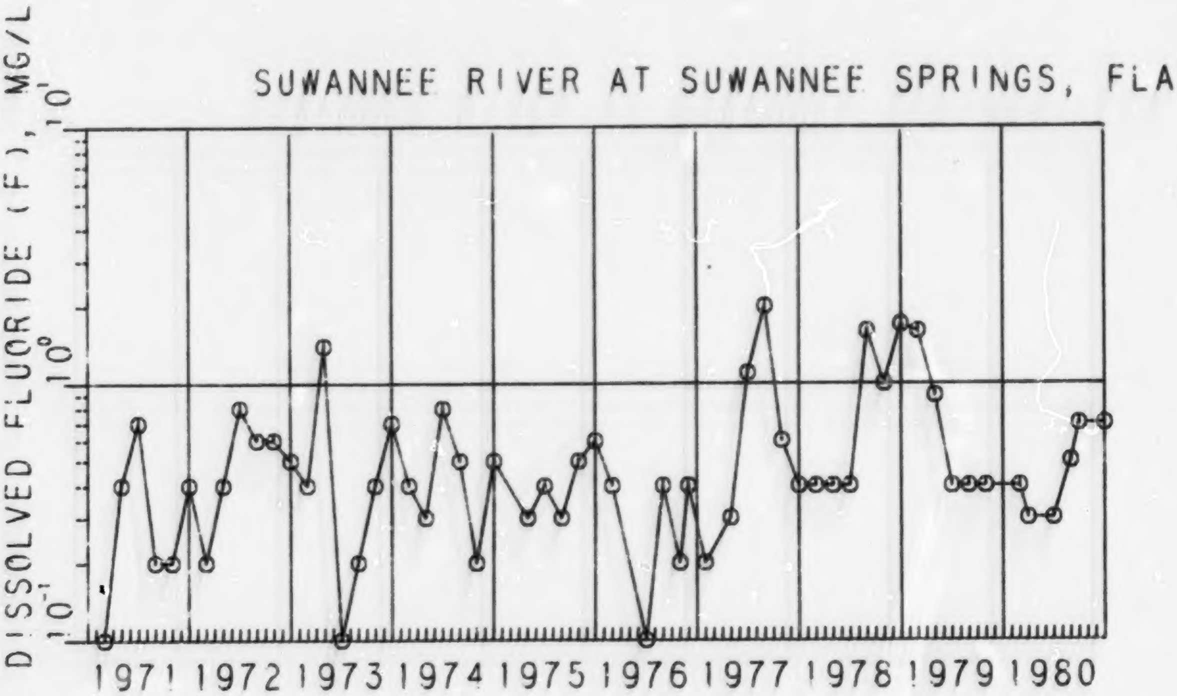
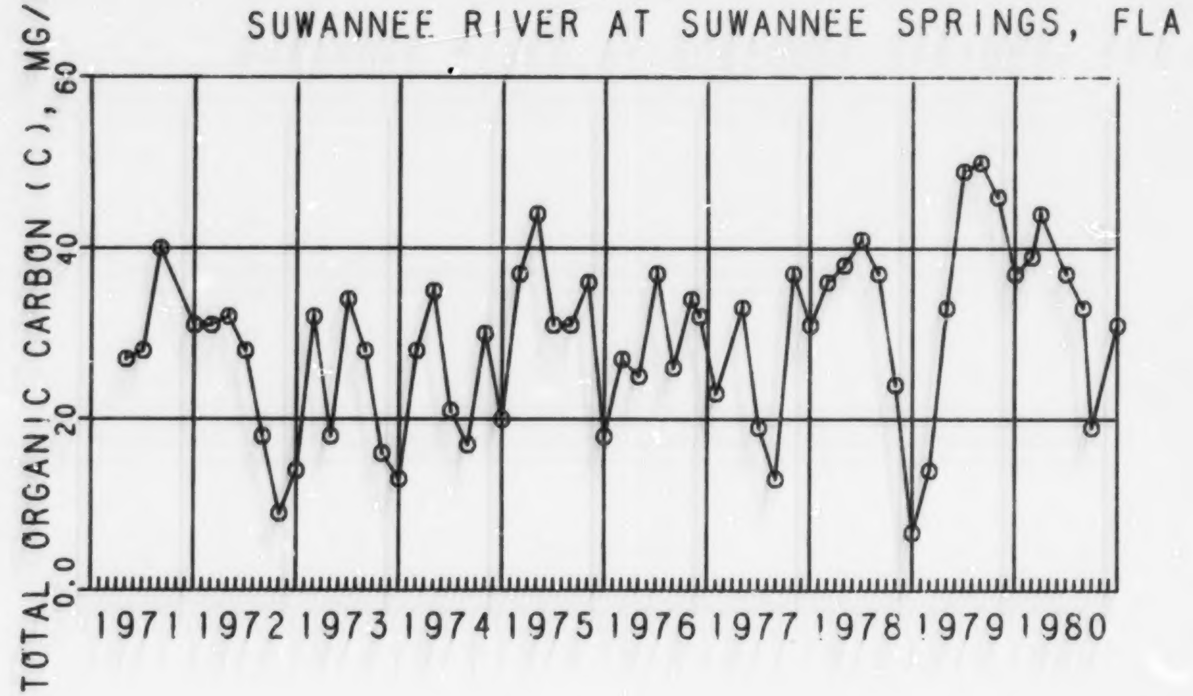


Figure 39.--pH and dissolved fluoride for Suwannee River at Suwannee Springs, 1971-80.



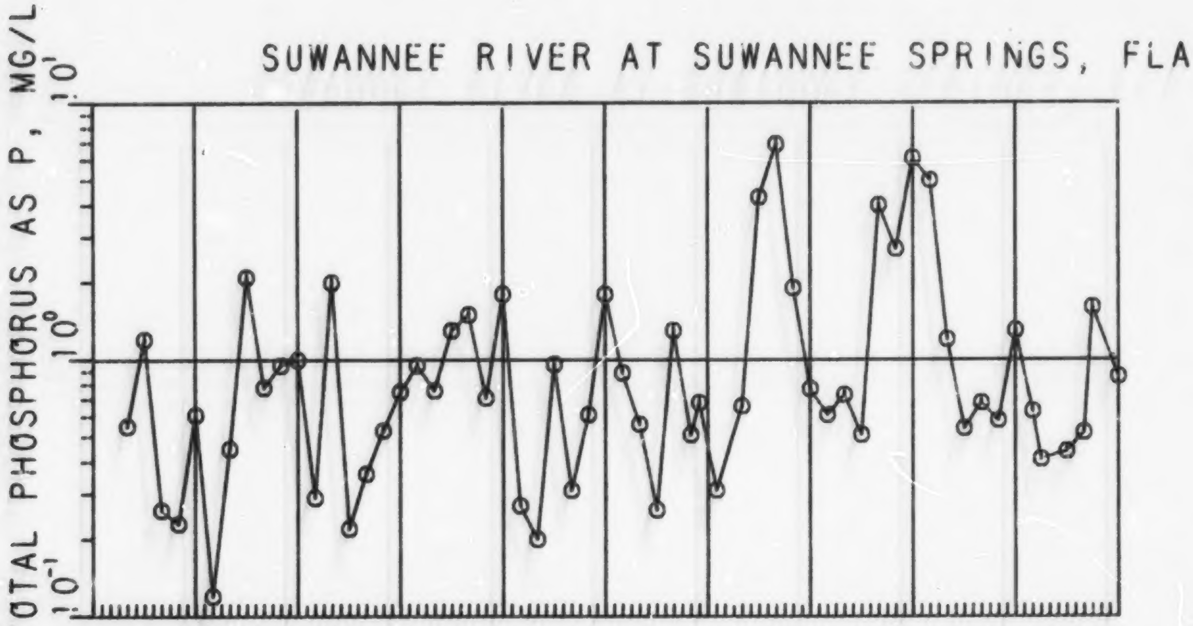
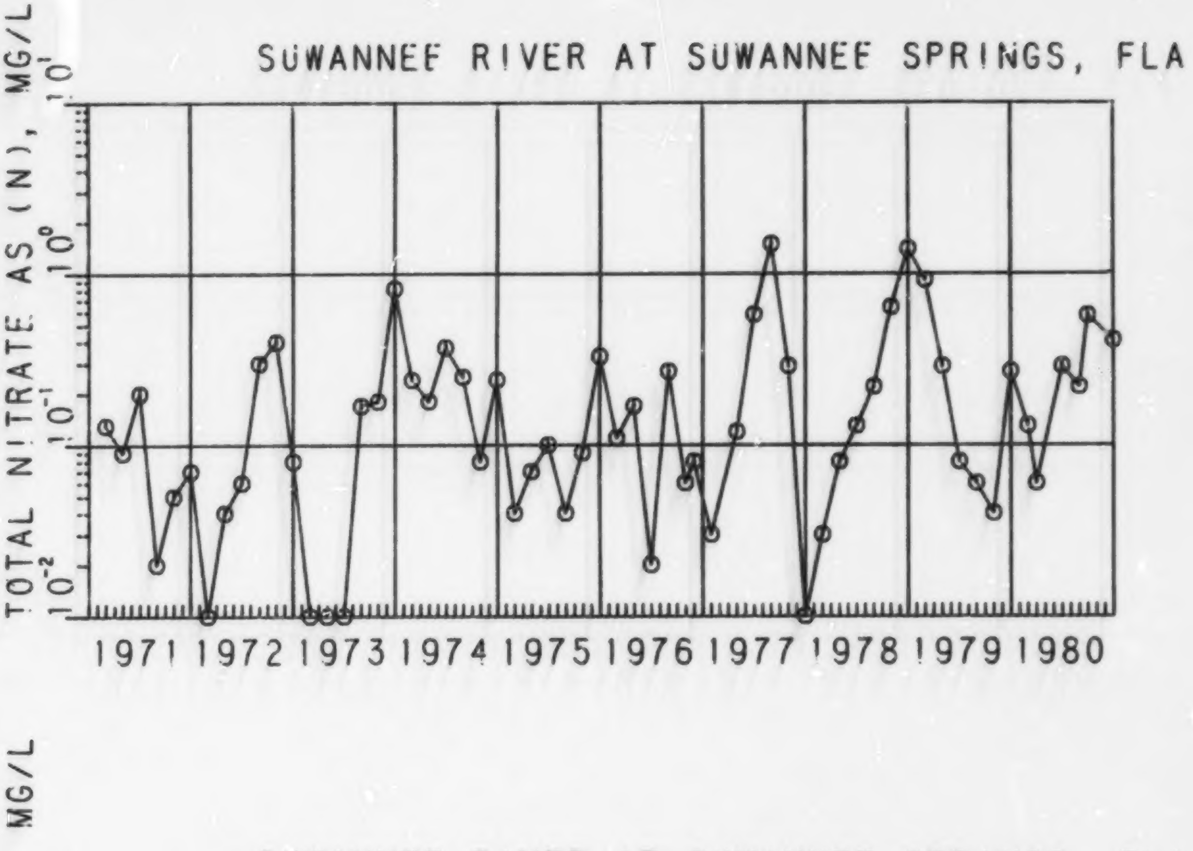


Figure 40.--Total organic carbon and total phosphorus for Suwannee River at Suwannee Springs, 1971-80.



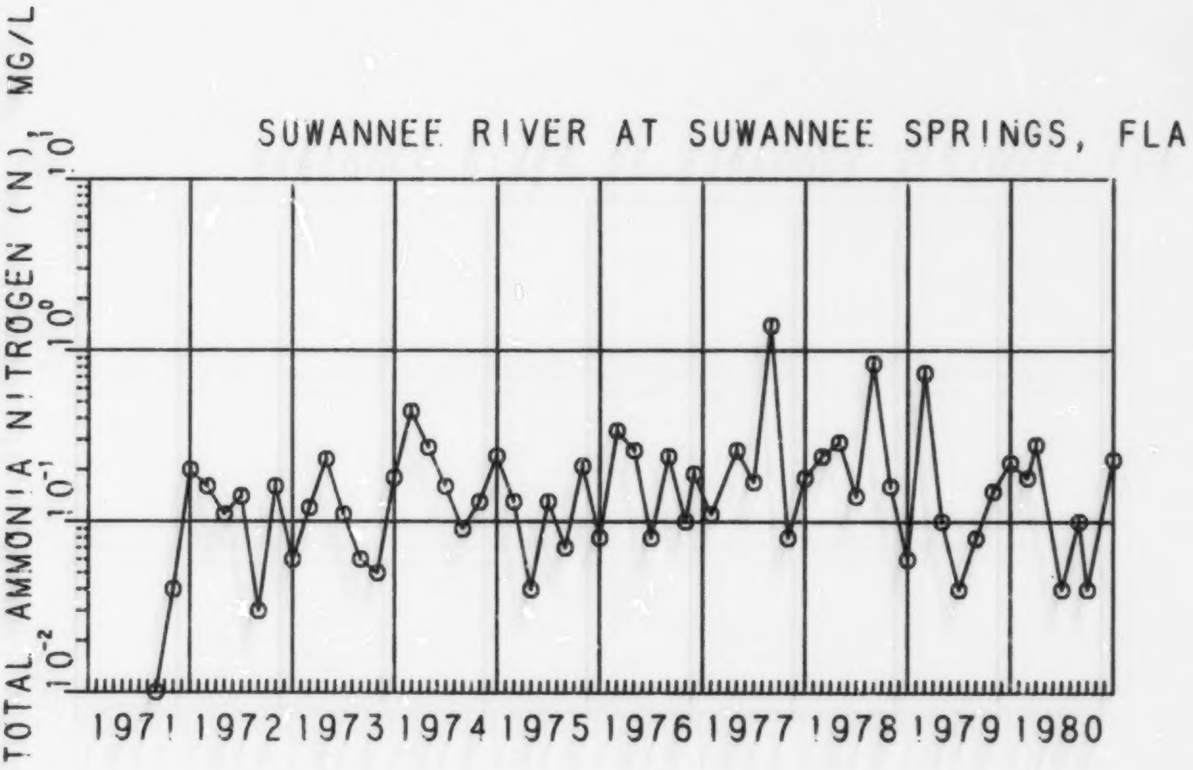
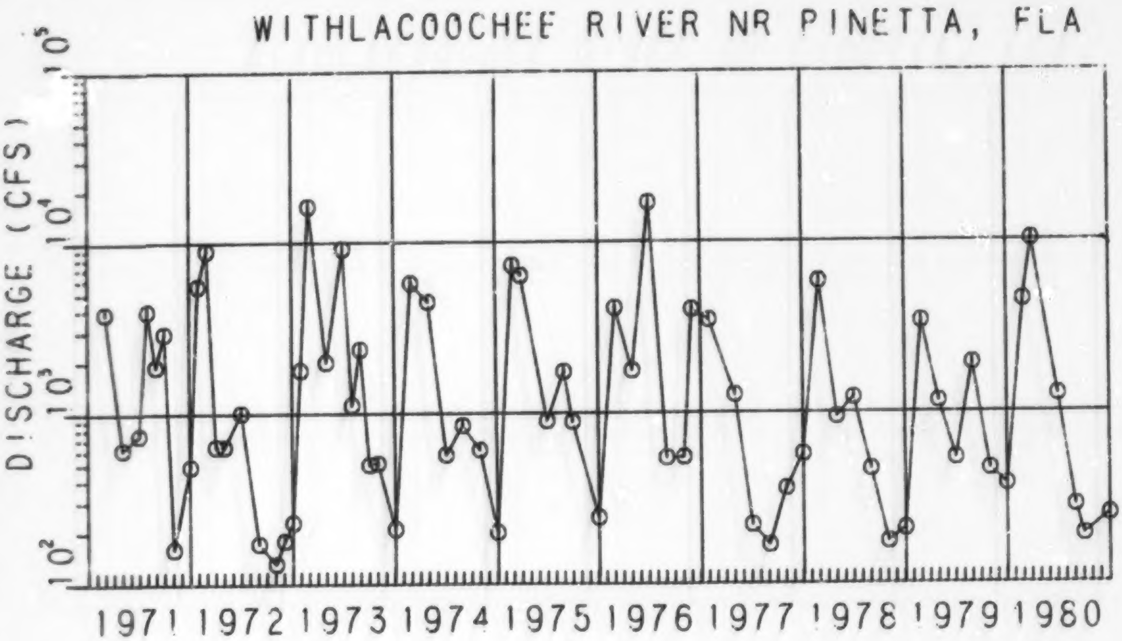


Figure 41.--Total nitrate and total ammonia nitrogen for Suwannee River at Suwannee Springs, 1971-80.



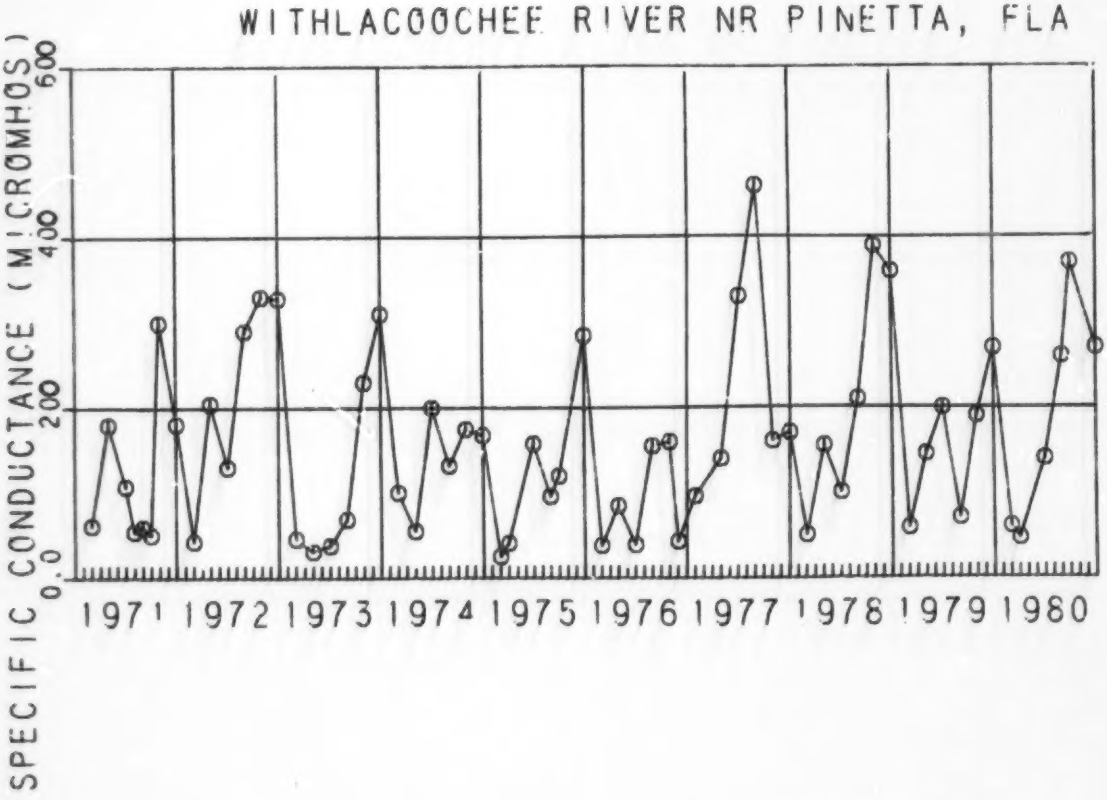


Figure 42.--Discharge and specific conductance for Withlacoochee River near Pinetta, 1971-80.

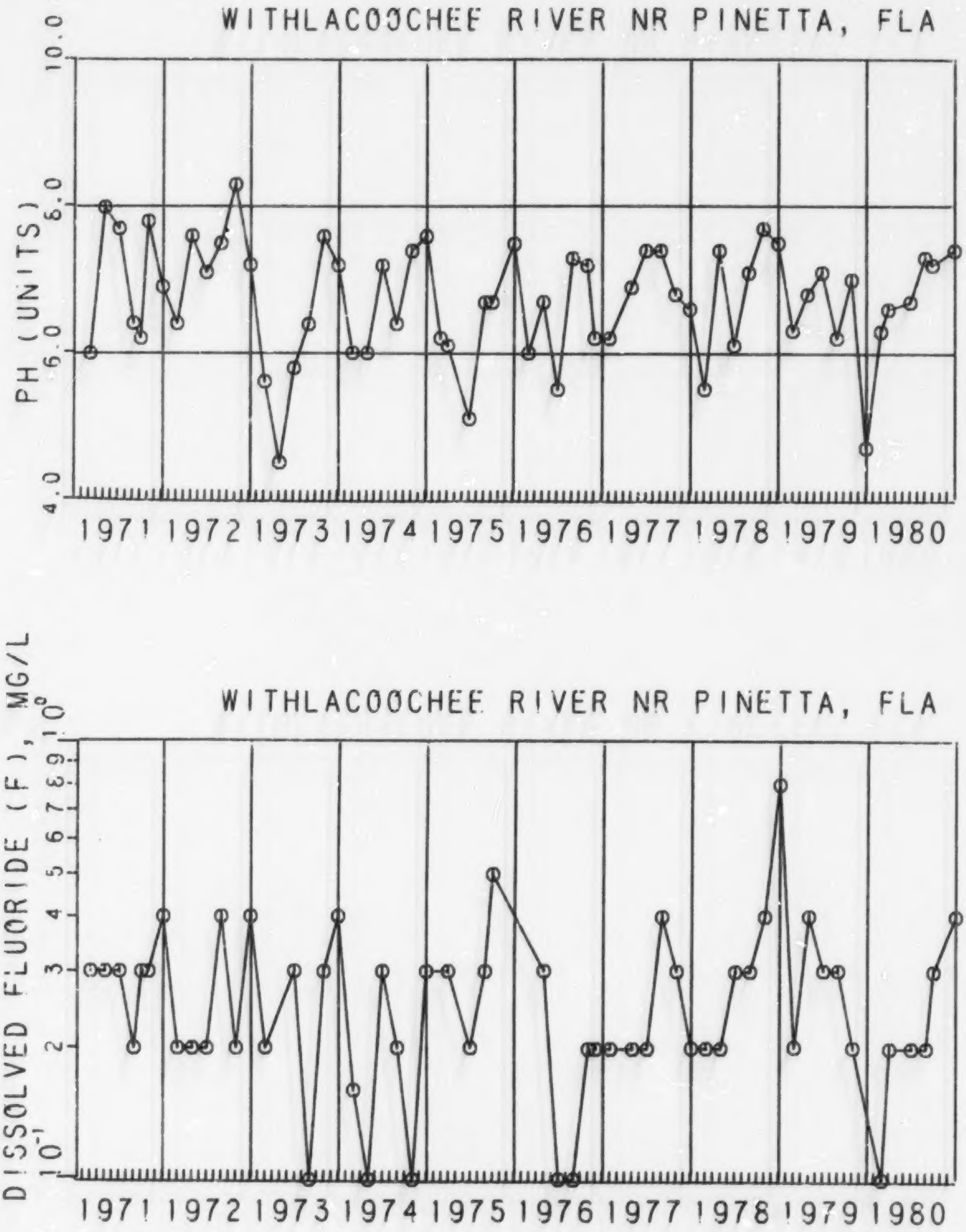


Figure 43.--pH and dissolved fluoride for Withlacoochee River near Pinetta, 1971-80.

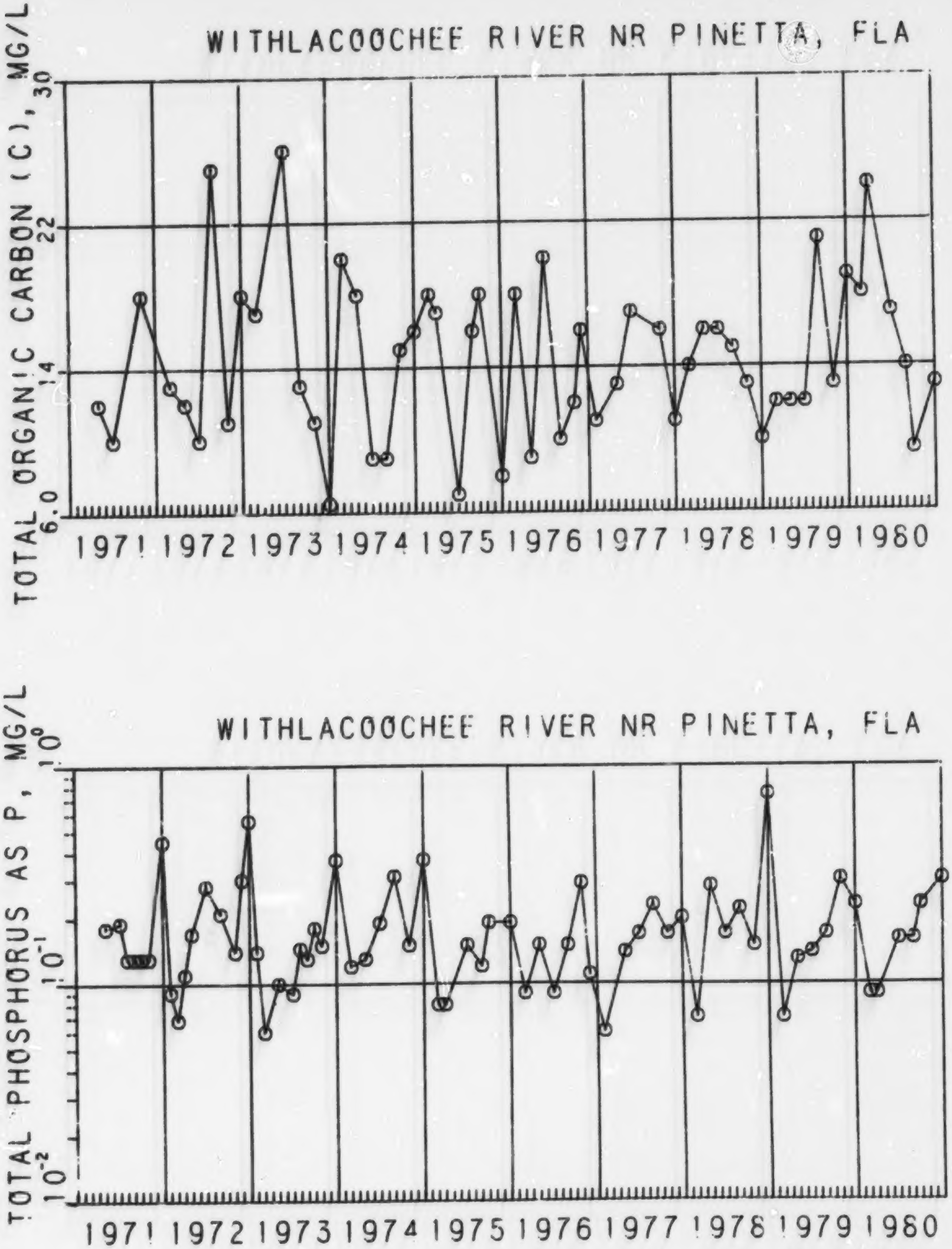


Figure 44.--Total organic carbon and total phosphorus for Withlacoochee River near Pinetta, 1971-80.

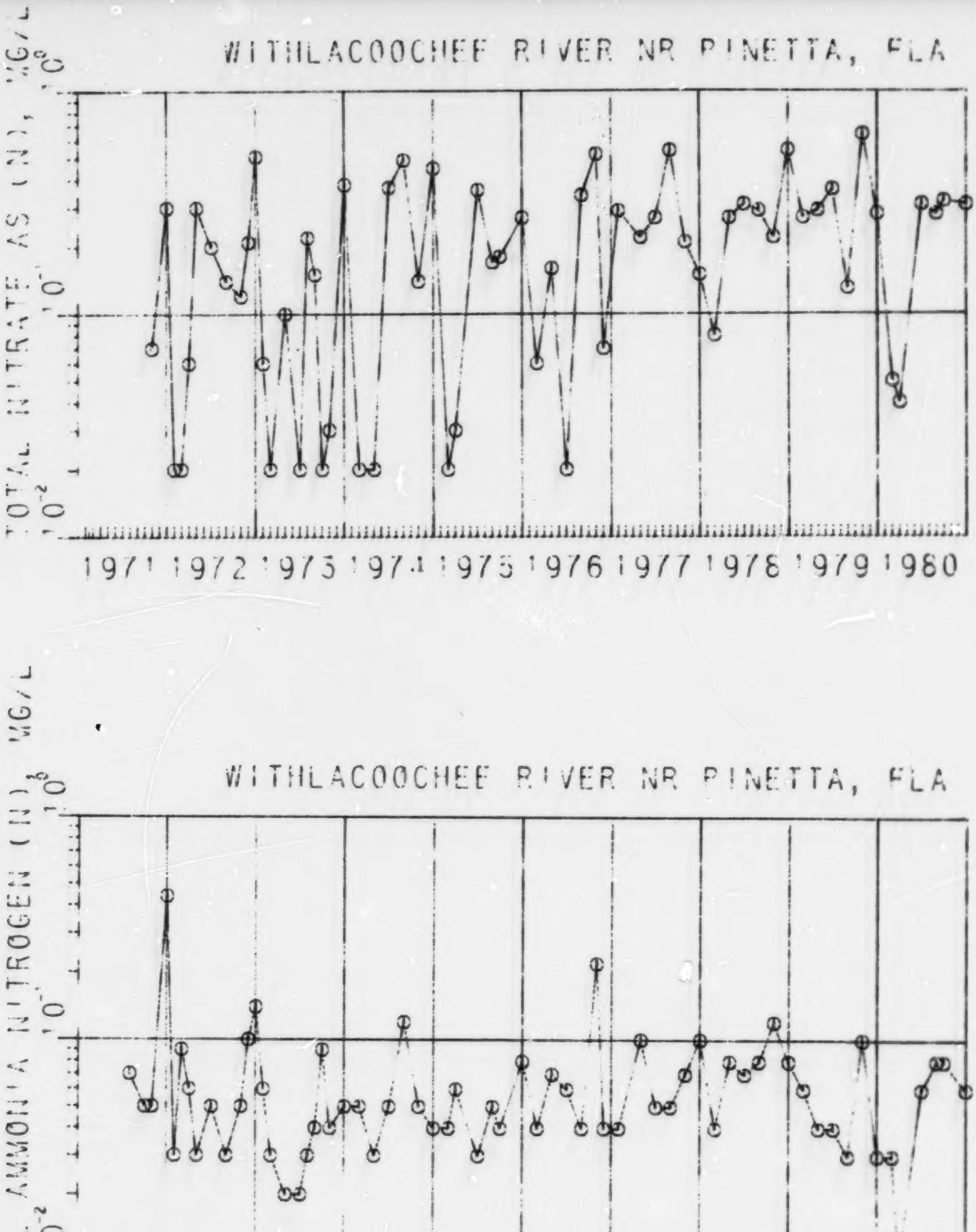


Figure 45.--Total nitrate and total ammonia nitrogen for Withlacoochee River near Pinetta, 1971-80.

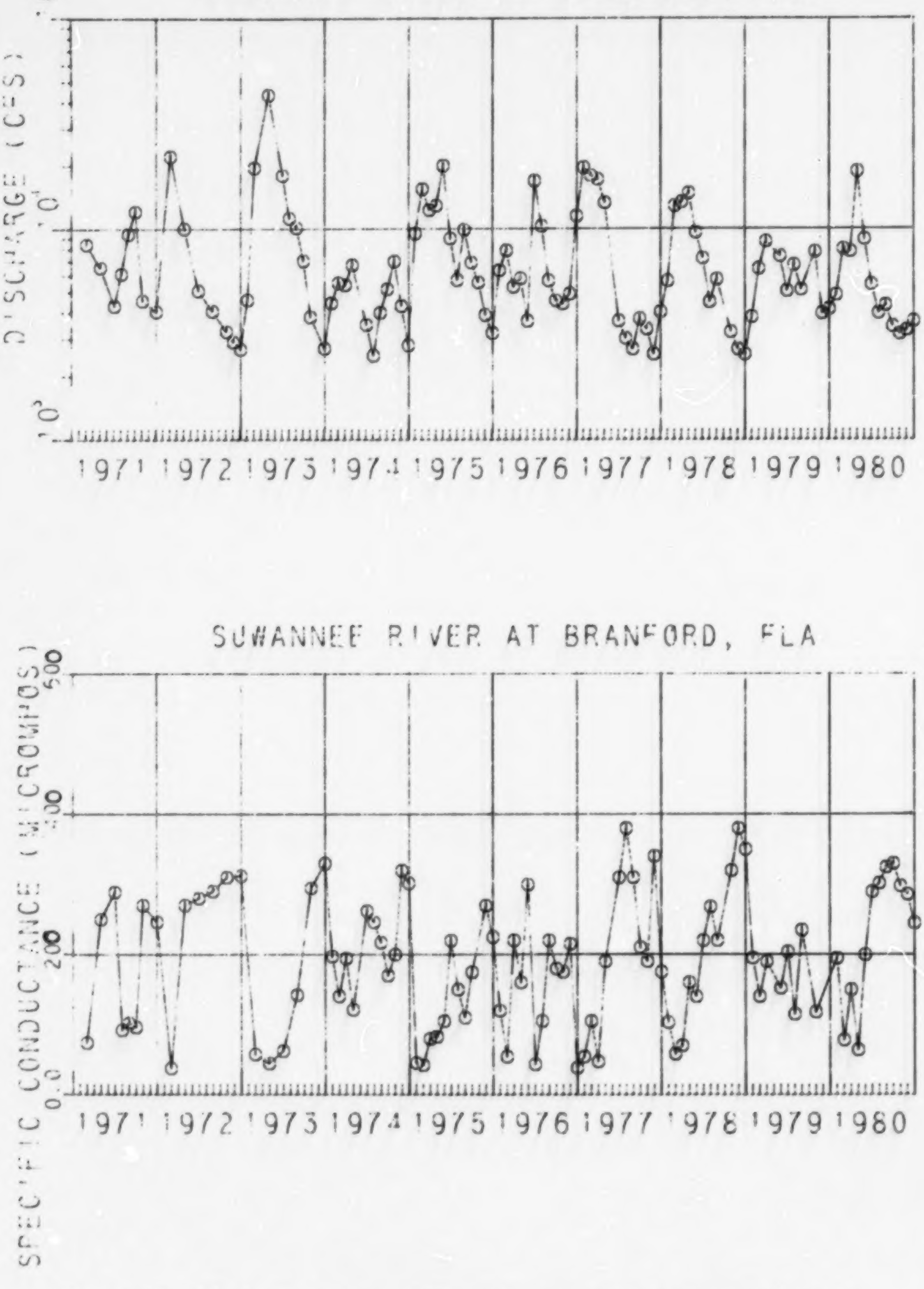


Figure 46.--Discharge and specific conductance for Suwannee River at Branford, 1971-80.

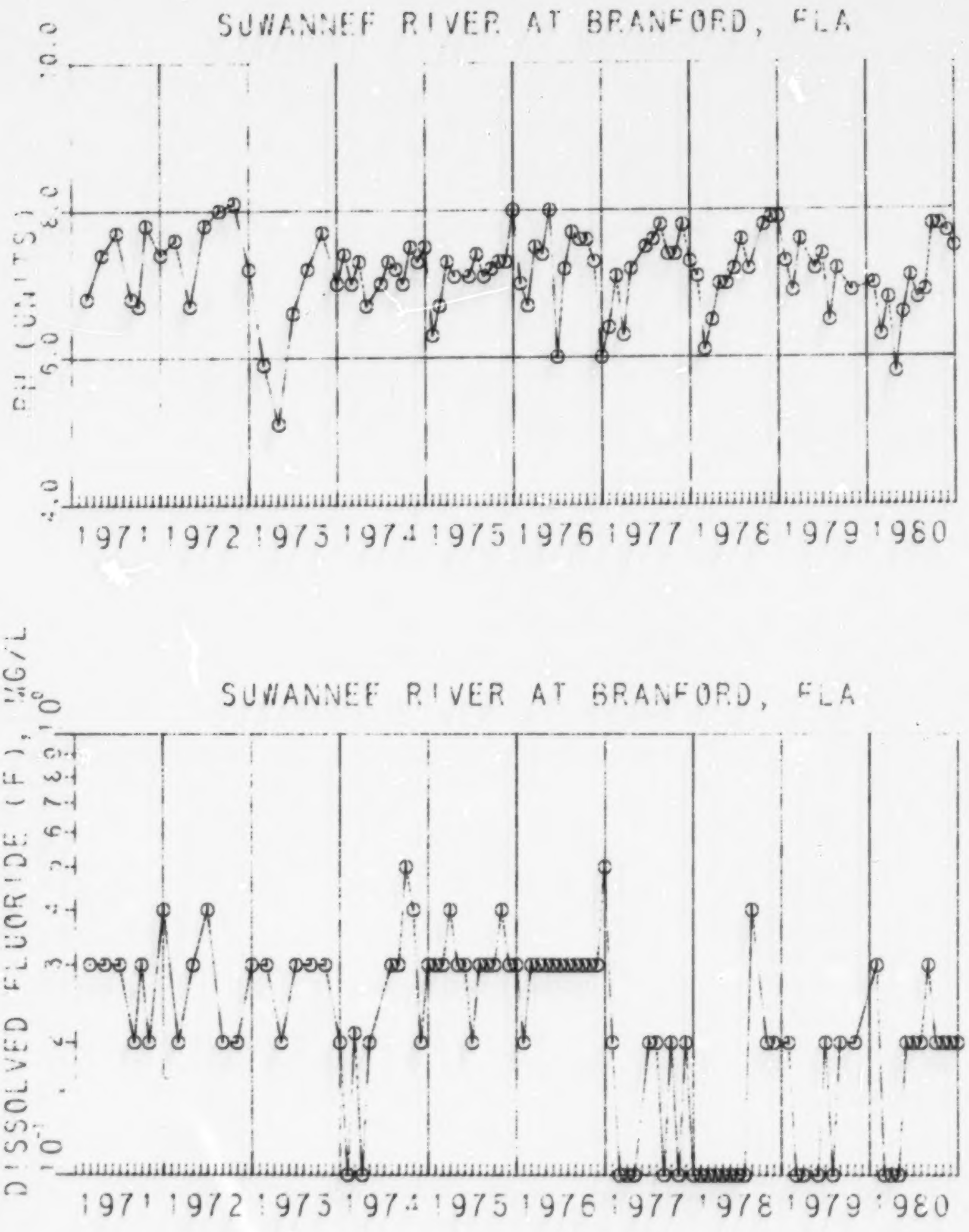
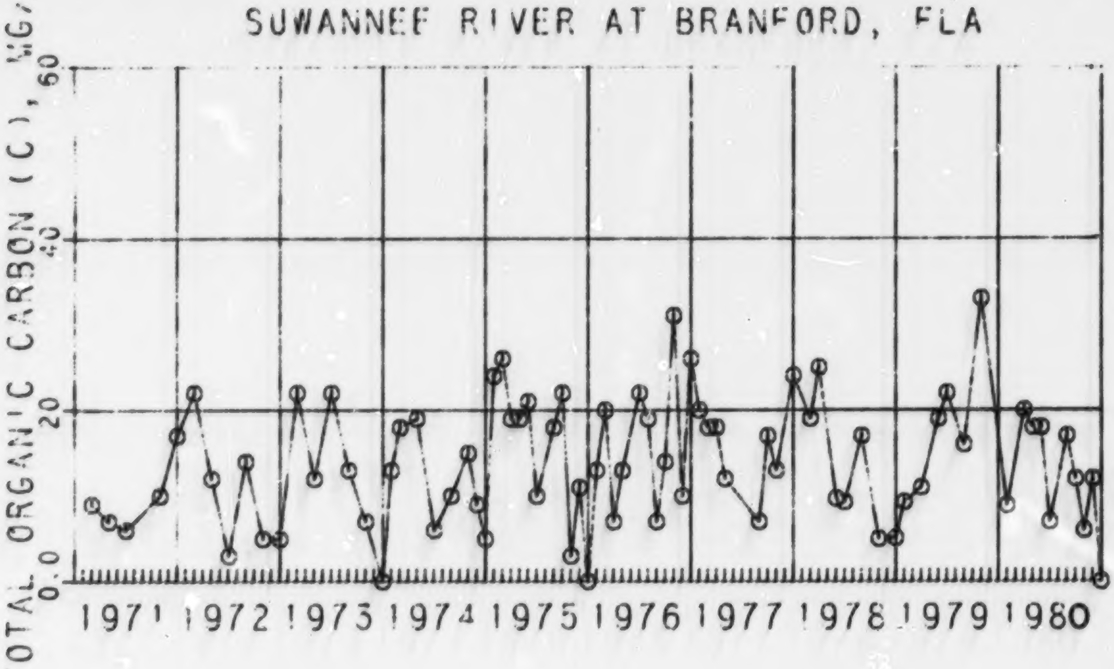


Figure 47.--pH and dissolved fluoride for Suwannee River at Branford, 1971-80.



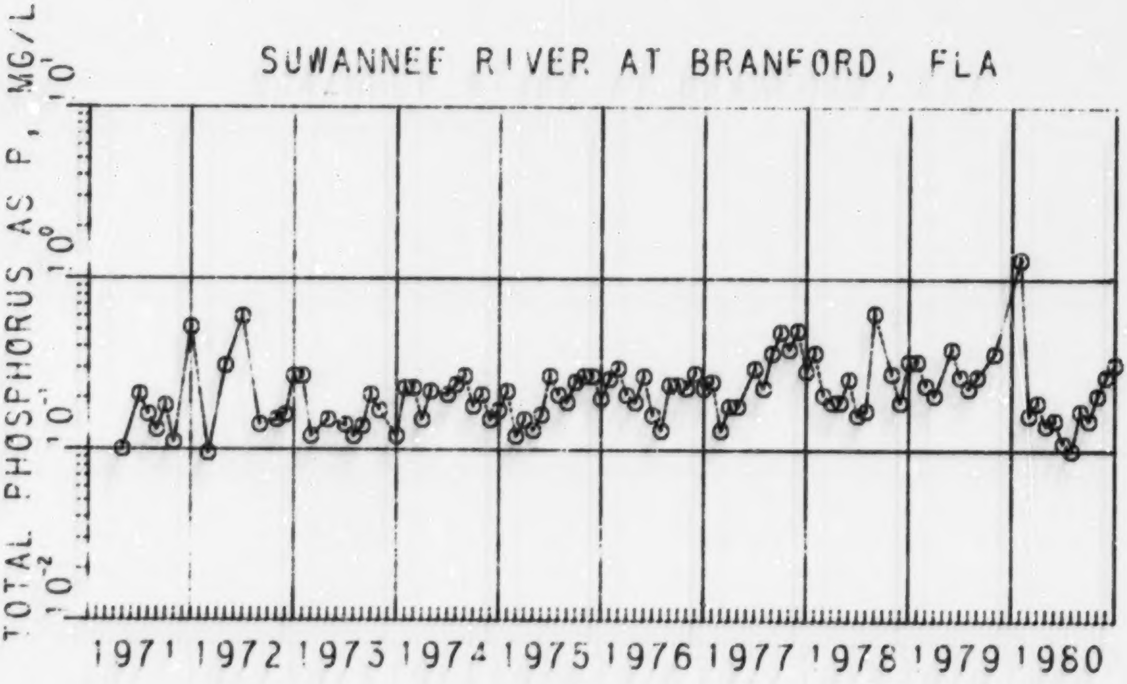
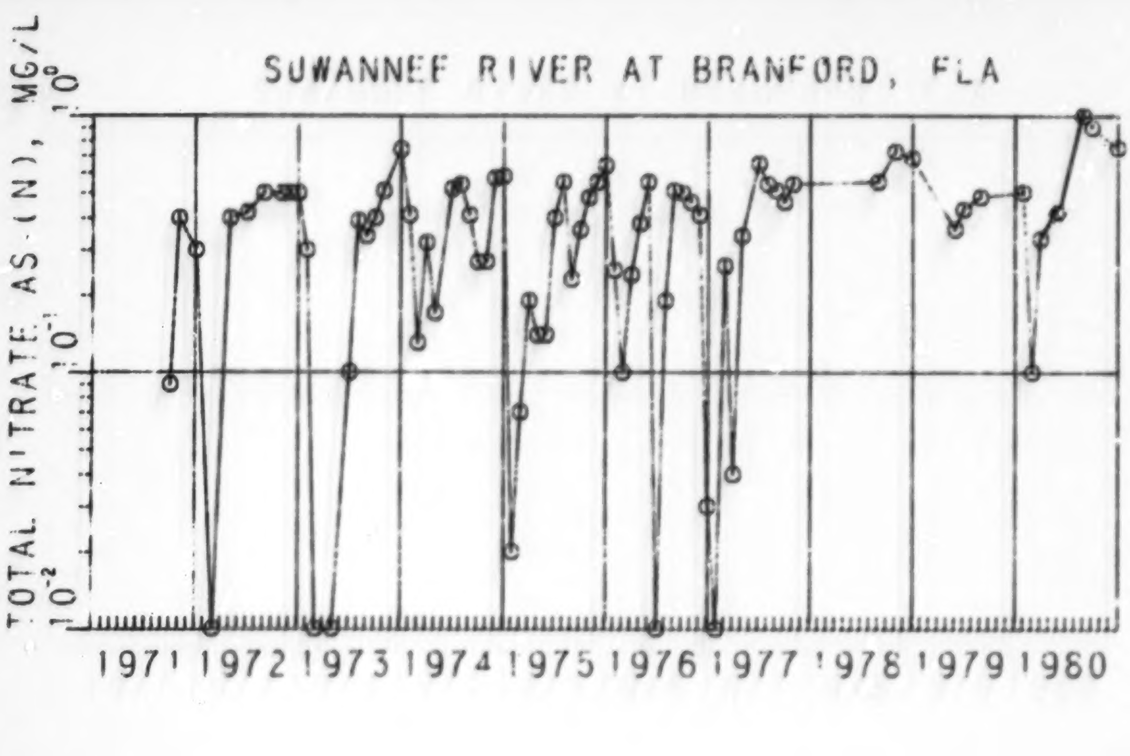


Figure 48.--Total organic carbon and total phosphorus for Suwannee River at Branford, 1971-80.



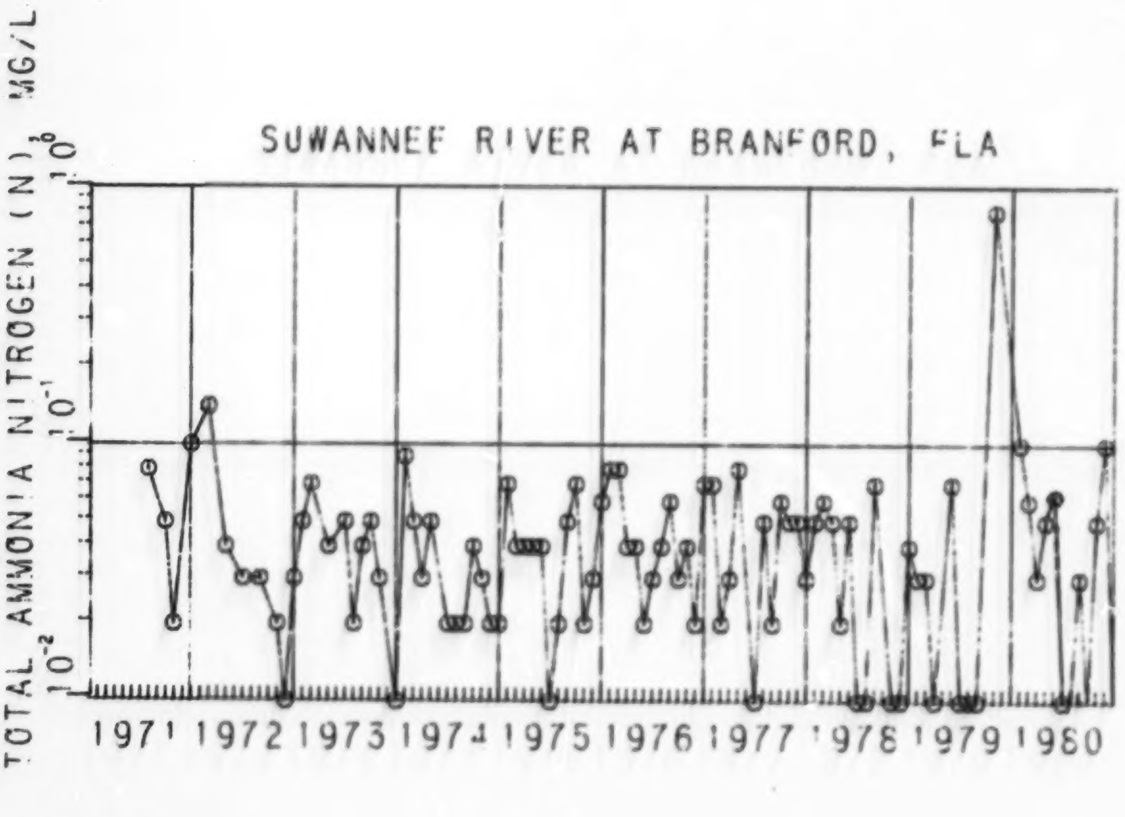


Figure 49.--Total nitrate and total ammonia nitrogen for Suwannee River at Branford, 1971-80.

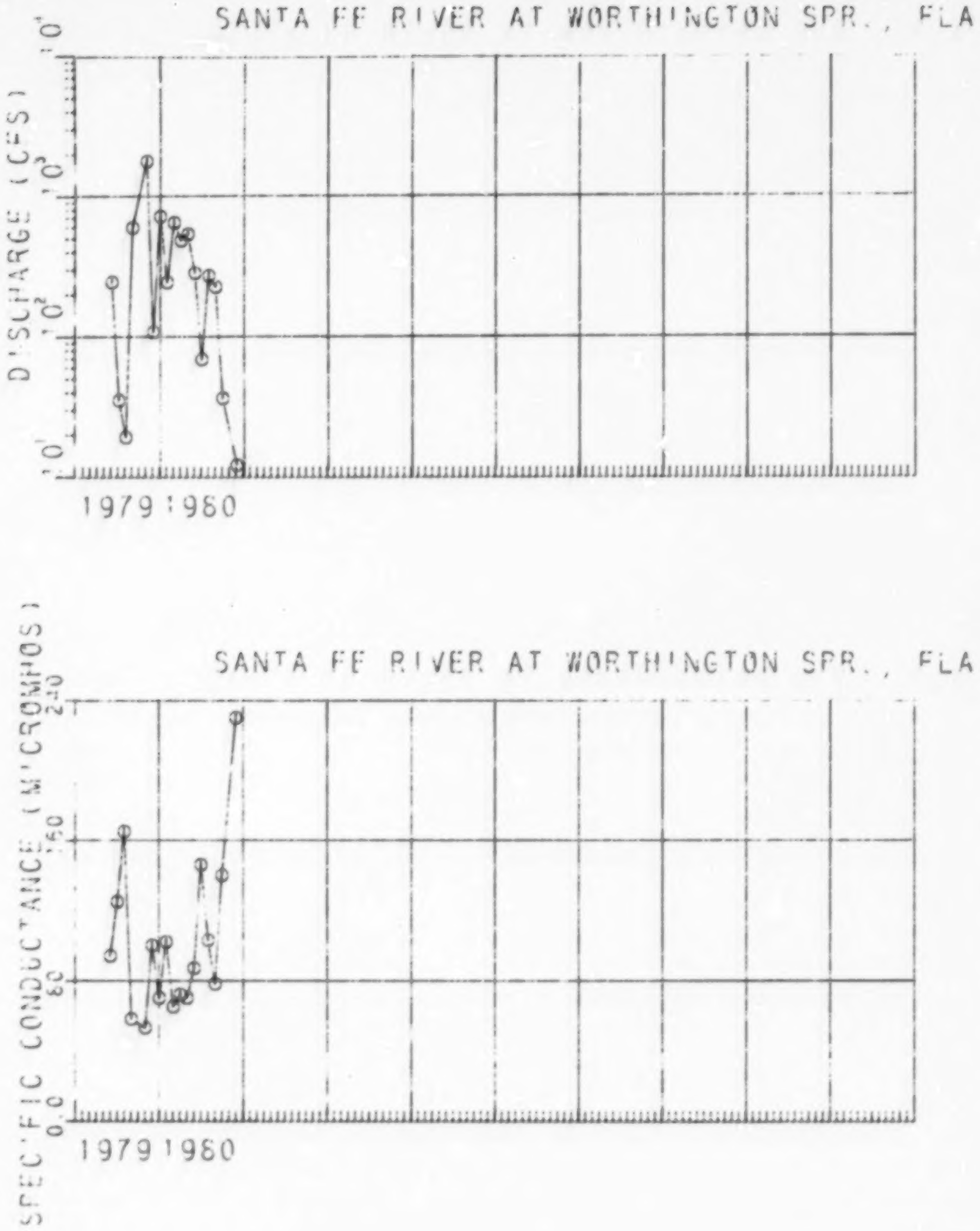


Figure 50.--Discharge and specific conductance for Santa Fe River at Worthington Springs, 1979-80.

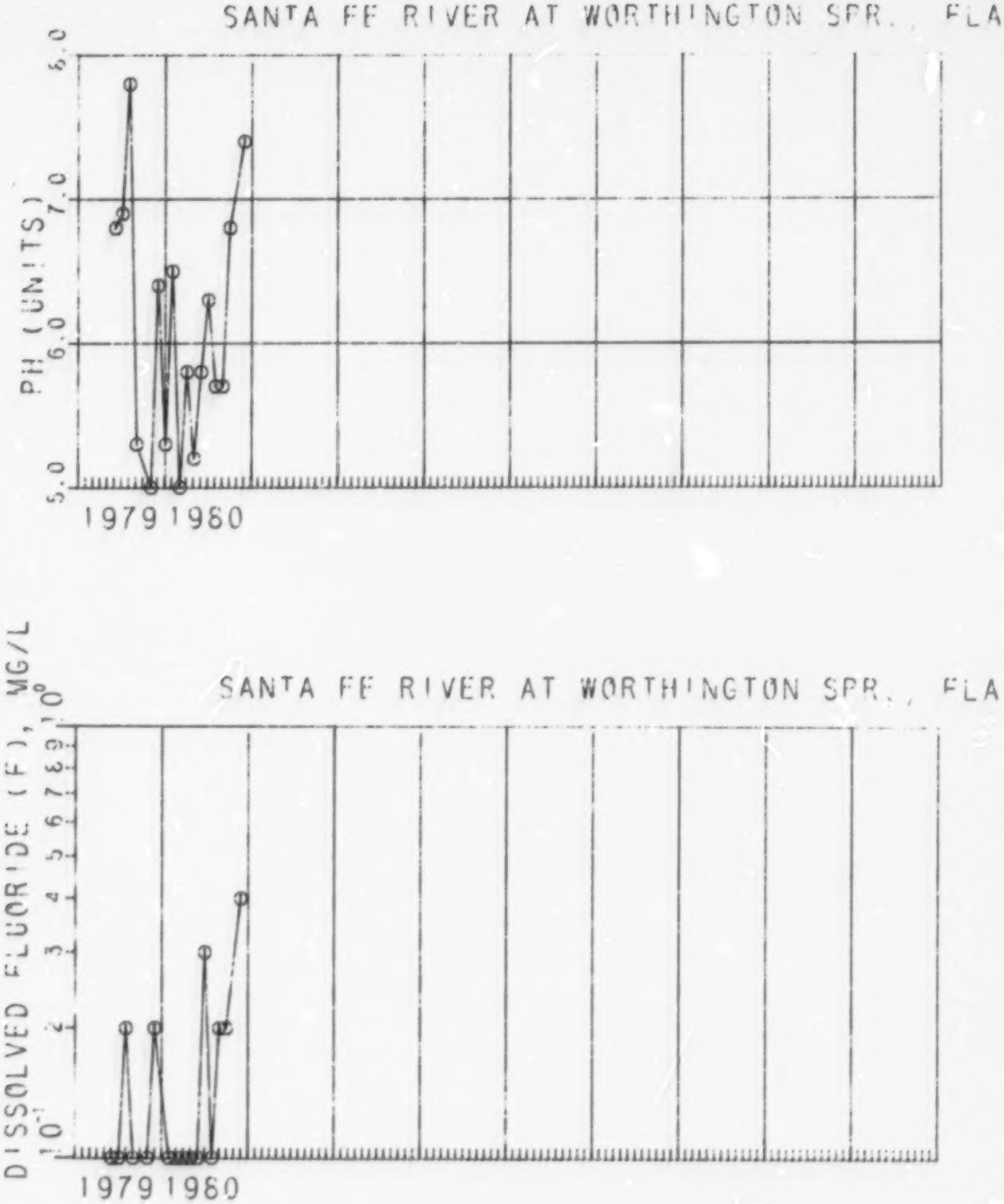


Figure 51.--pH and dissolved fluoride for Santa Fe River at Worthington Springs, 1979-80.

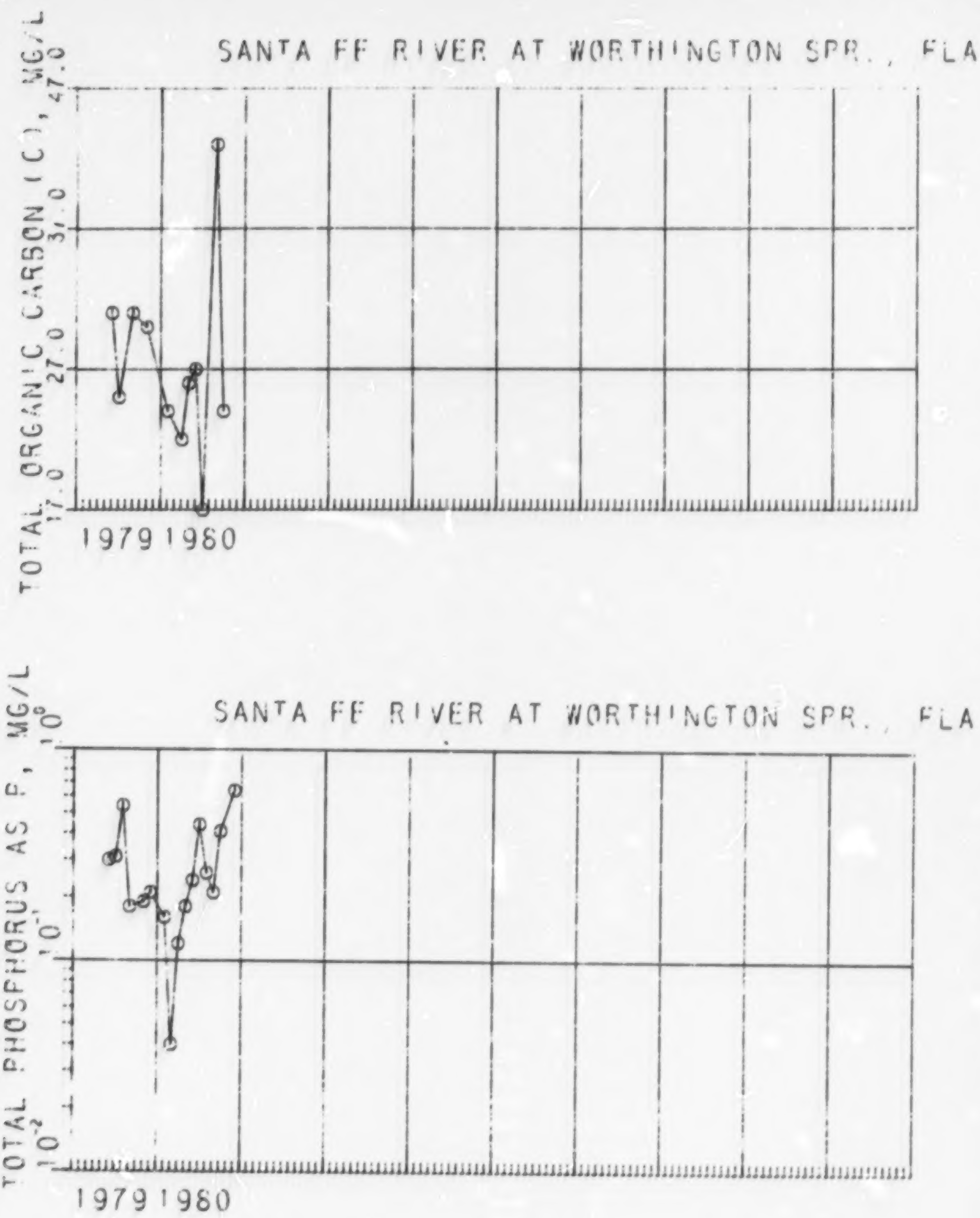


Figure 52.--Total organic carbon and total phosphorus for Santa Fe River at Worthington Springs, 1979-80.

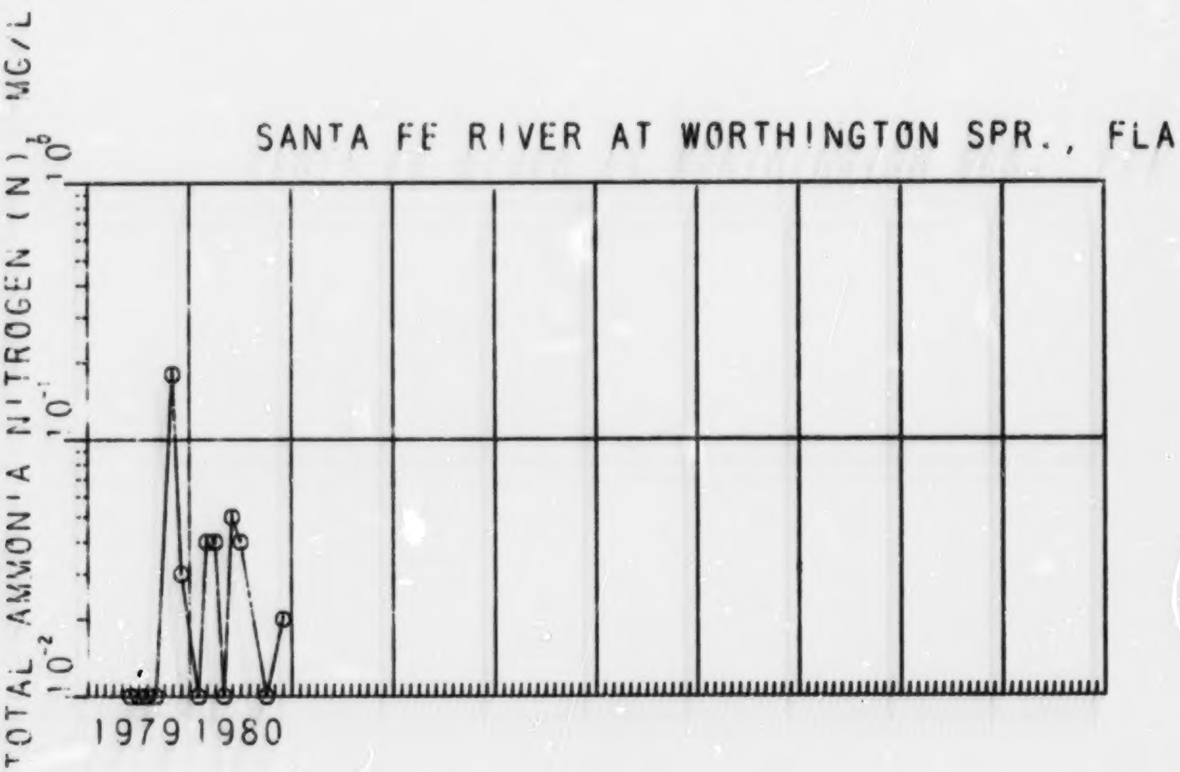


Figure 53.--Total ammonia nitrogen for Santa Fe River at Worthington Springs, 1979-80.

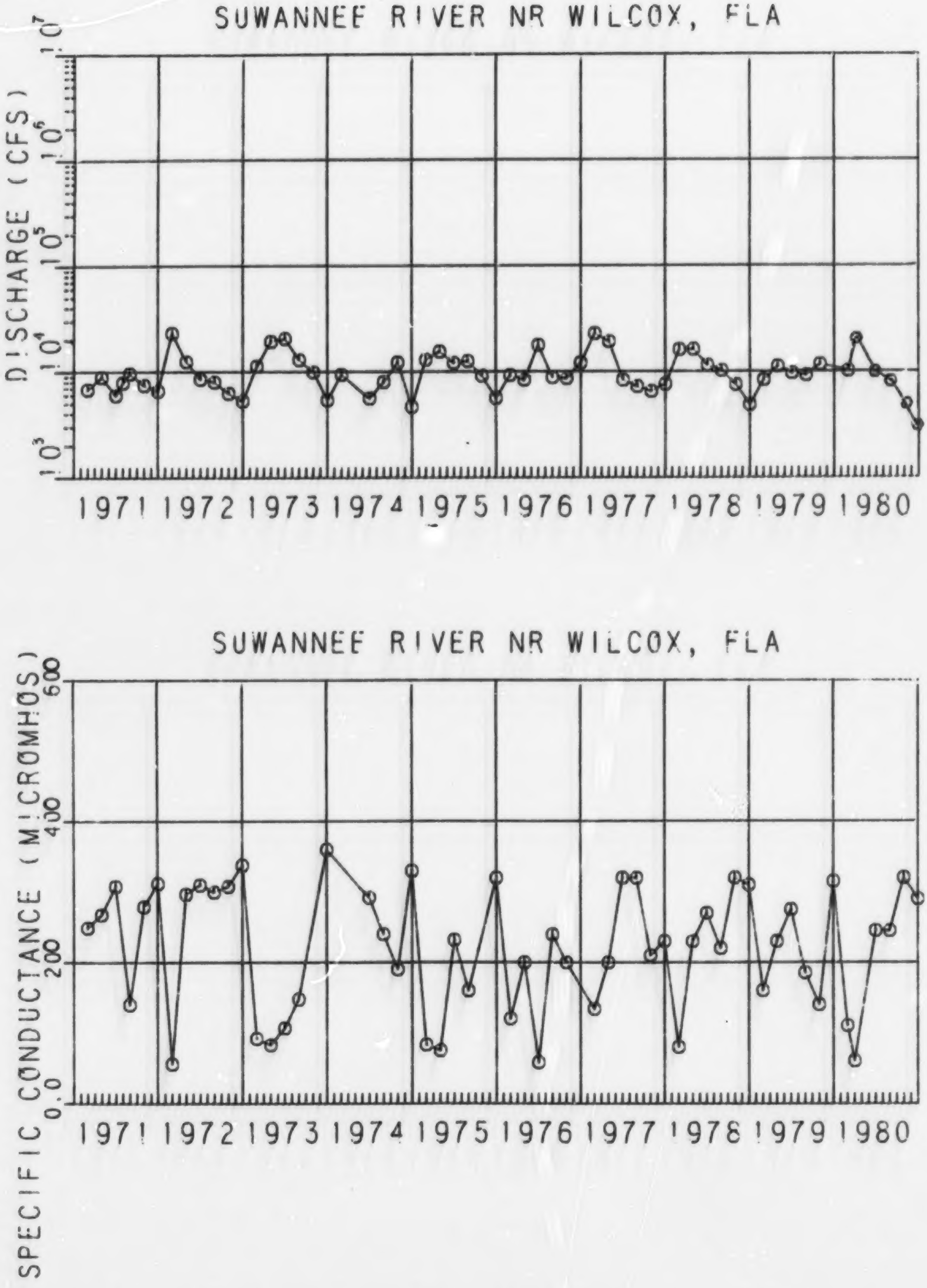


Figure 54.--Discharge and specific conductance for Suwannee River near Wilcox, 1971-80.

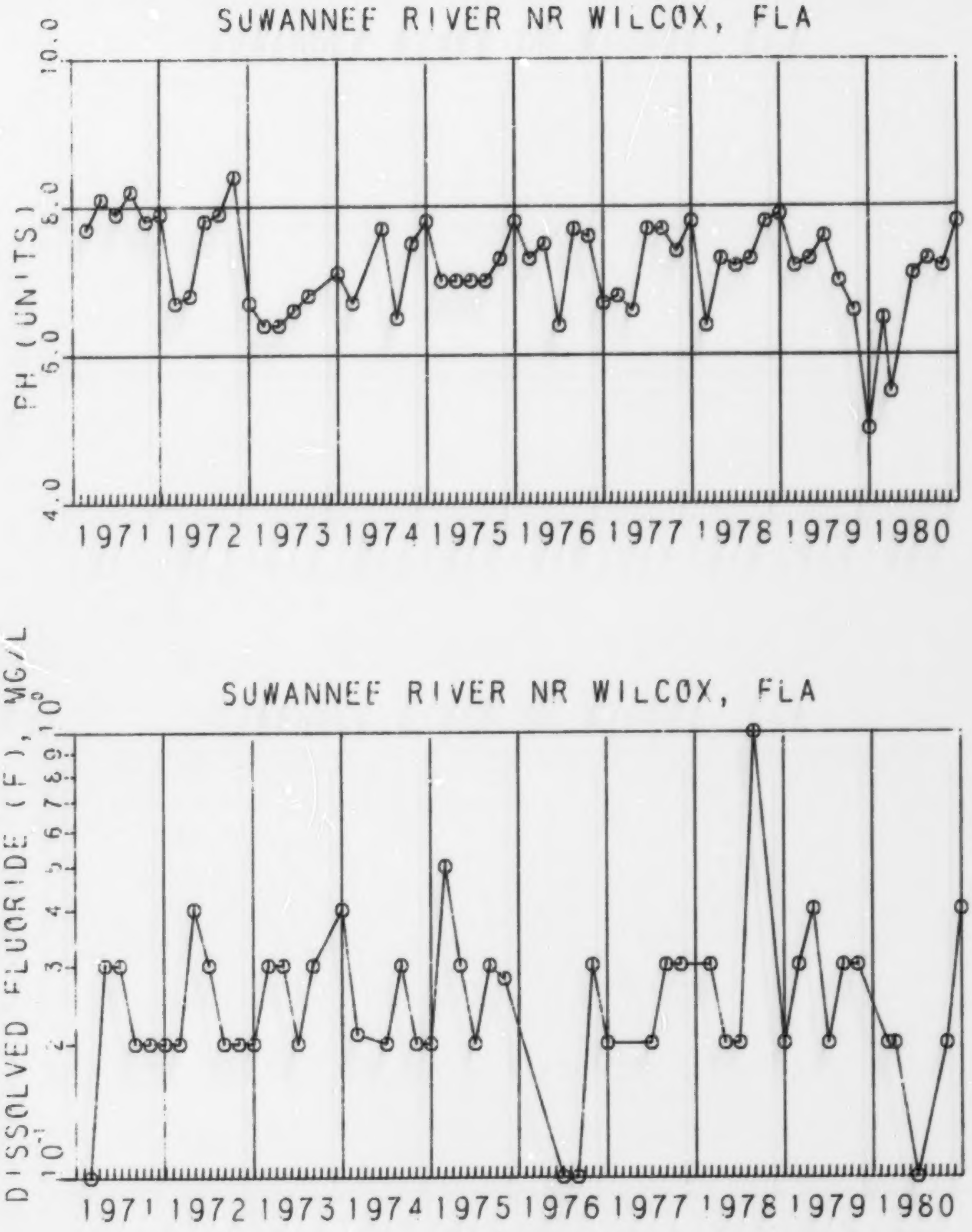
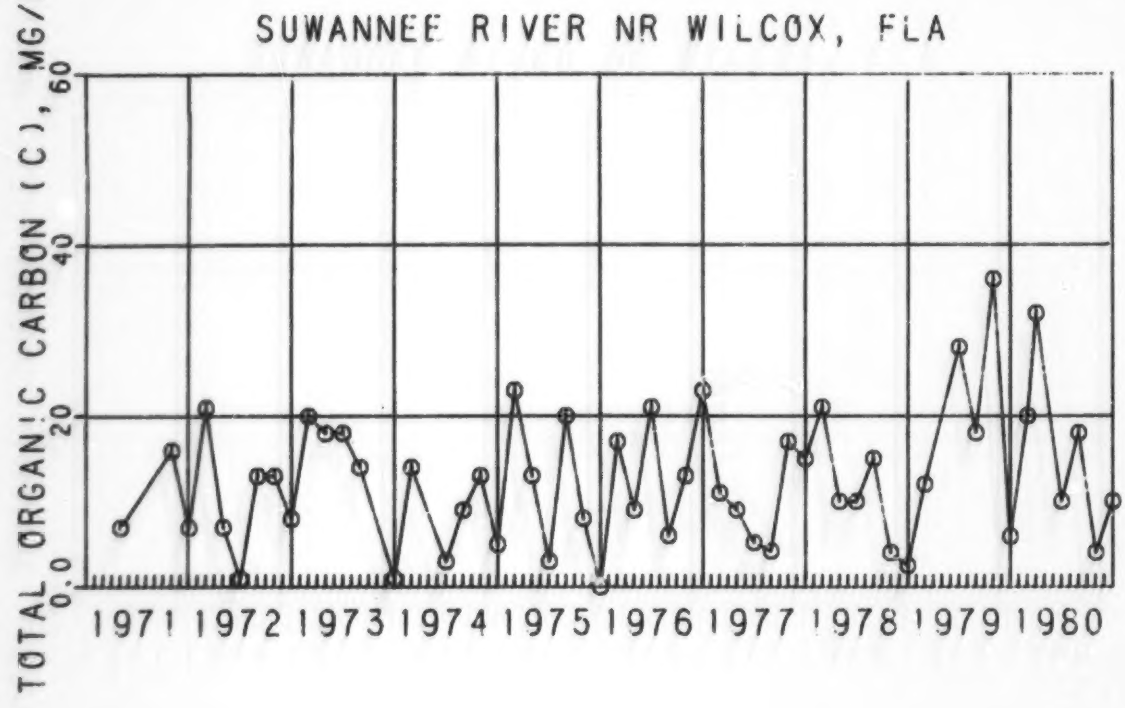


Figure 55.--pH and dissolved fluoride for Suwannee River near Wilcox, 1971-80.



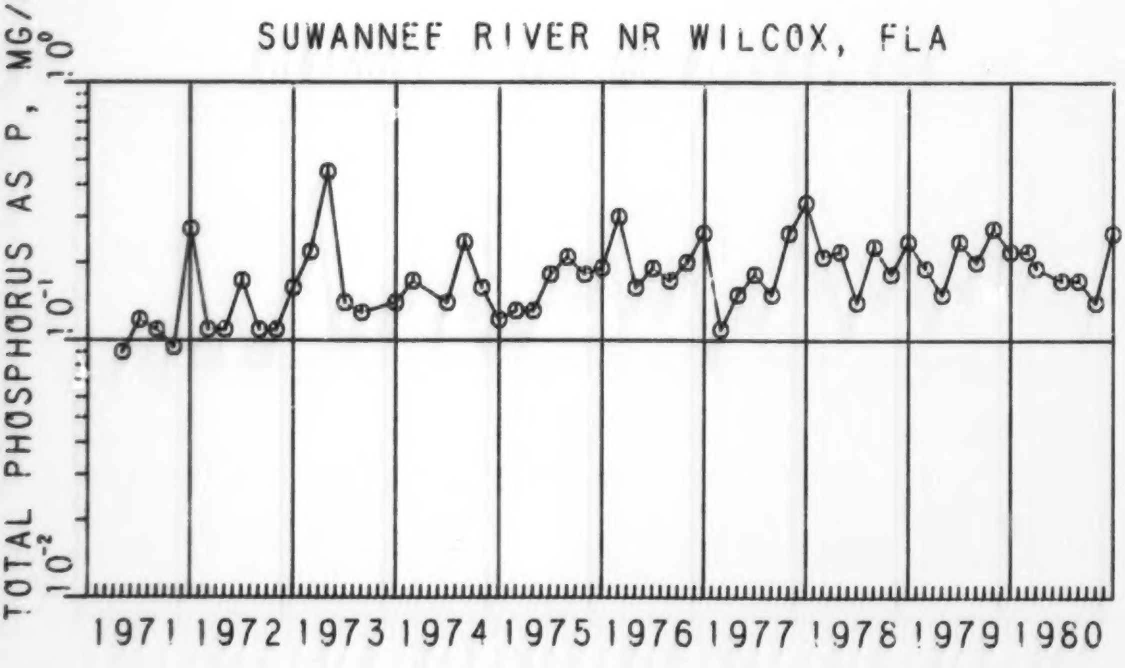
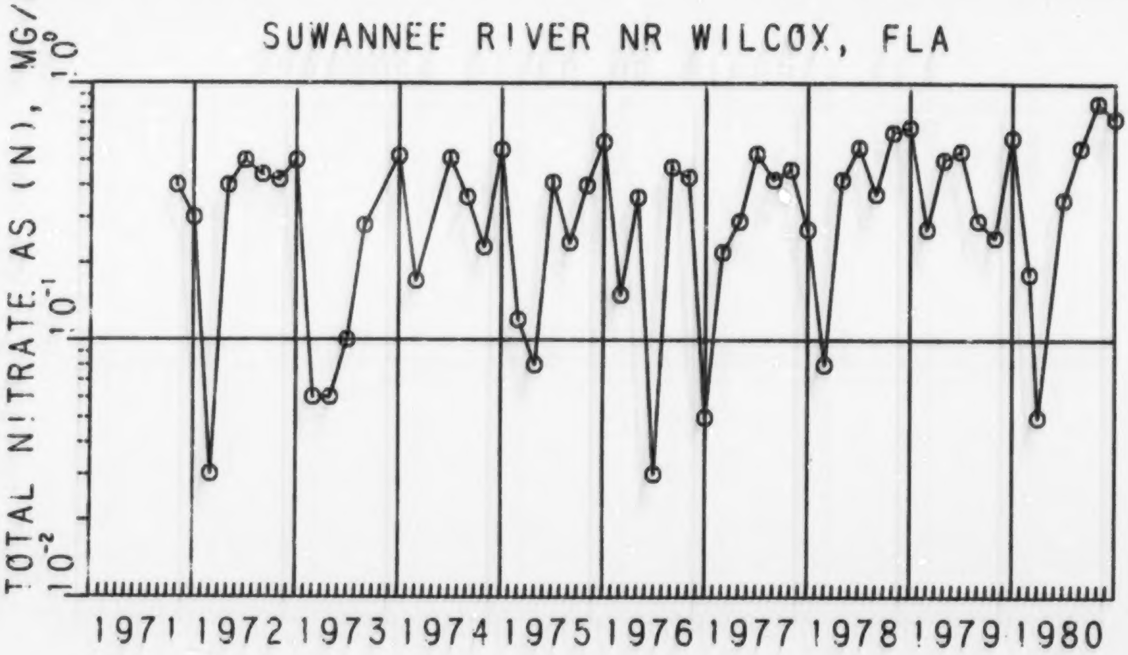


Figure 56.--Total organic carbon and total phosphorus for Suwannee River near Wilcox, 1971-80.



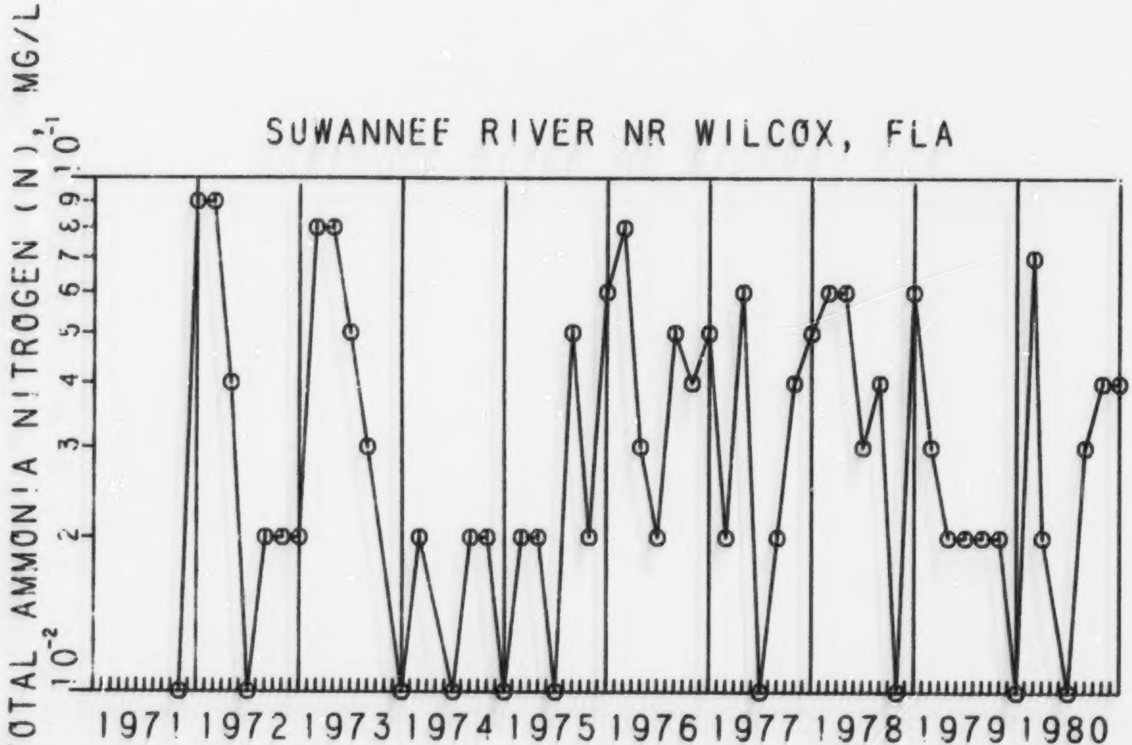


Figure 57.--Total nitrate and total ammonia nitrogen for Suwannee River near Wilcox, 1971-80.

*U.S. GOVERNMENT PRINTING OFFICE: 1981-546-161/49